AUTOMOTIVE INDUSTRIES
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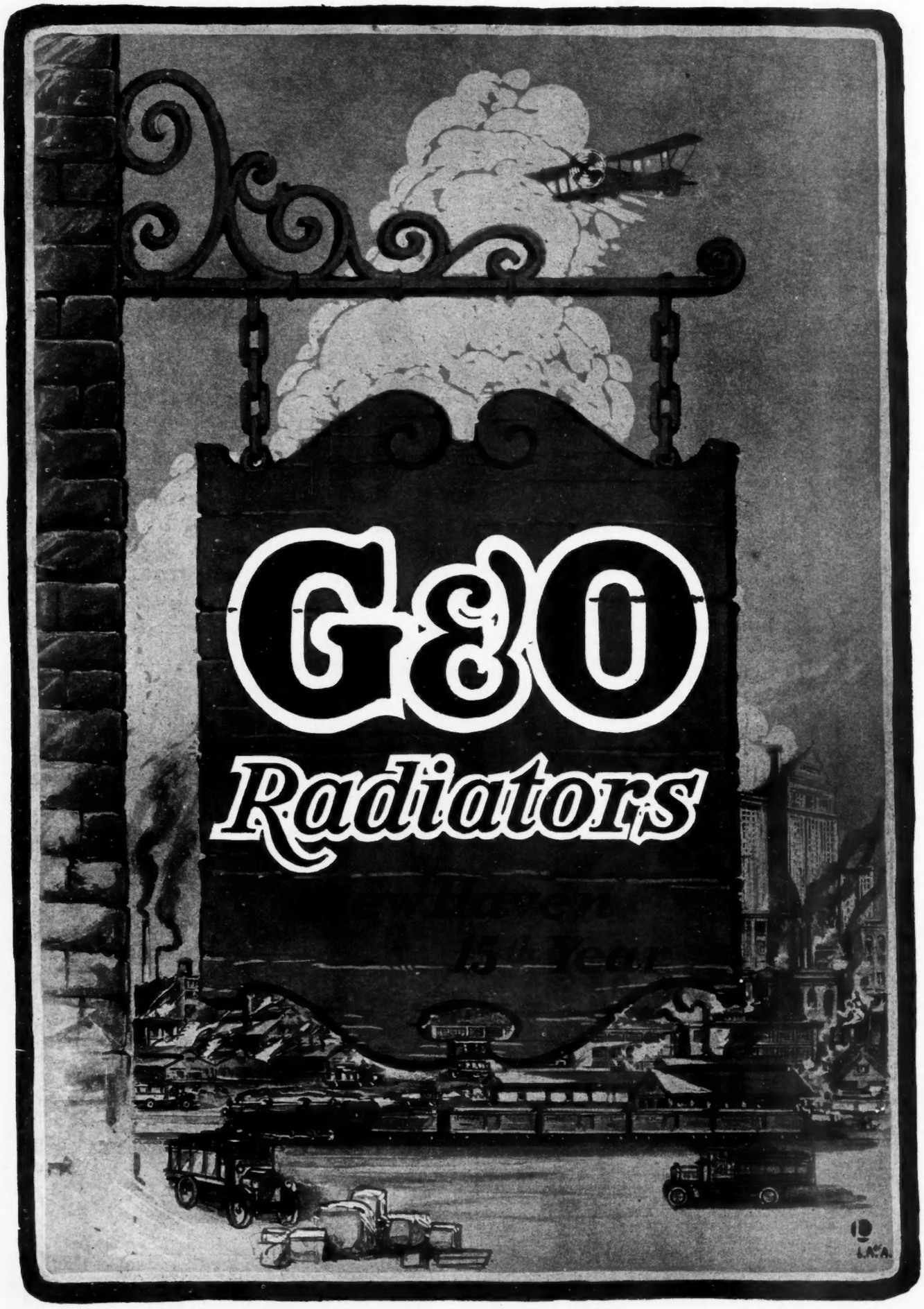
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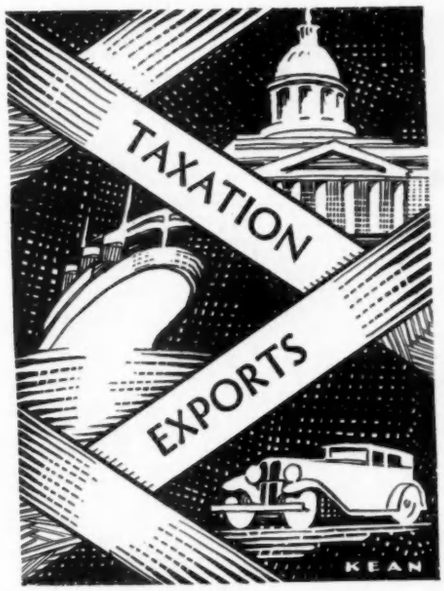
AUTOMOTIVE INDUSTRIES

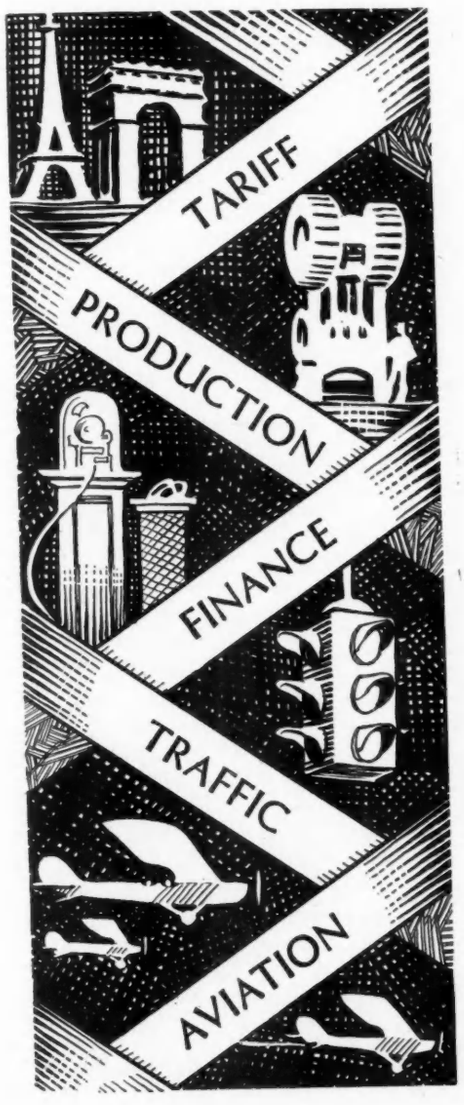
VOLUME 62 MAY 10, 1930 NUMBER 19

Chamber's Discussion Centers on Automobiles



Tariff, based on world trade, bus regulation and inter-American highways are subjects of annual meeting's resolutions

By Leslie Peat



THE automobile industry, represented by some of its most important leaders, played a dominant part in the eighteenth annual meeting of the Chamber of Commerce of the United States, which closed on May 1 in Washington with an address by President Hoover. The key topic, "What's Ahead for Business," found the automotive industry prepared for ample discussion in the conferences on tariff, export, insurance, finance, merchandising, transportation, trade practices and legislation.

Just before drawing to a close the delegates approved resolutions recommended by automobile interests, proposing:

1. A complete study of the tariff question, based on an analysis of existing and probable world trade developments;
2. Regulation of interstate bus lines, but in opposition to regulation of motor trucks, and
3. An inter-American highway.

A resolution to recognize the basic principles involved in the so-called financial responsibility laws as equitable failed to pass. Considerable difference of opinion was shown on the report of the Insurance Department Committee of the Chamber, asking for favorable action.

Because of the general publicity that had been given to the tariff situation, nearly a score of automobile executives attended the exporting conference on Tuesday, and developed considerable momentum for the approval of the resolution for making a basic study of the tariff. H. H. Rice, assistant to the president of the General Motors Corp., in discussing the export situation as seen by the automobile industry, pointed out that precautions must be taken to prevent excessively high duty barriers abroad if the industry and those manufactories which are supported by the auto-

The Outlook

"WE are not yet entirely through the difficulties of our situation; We have need to maintain every agency and every force that we have placed in motion until we are far along on the road to stable prosperity.

"He would be a rash man who would state that we can produce the economic millennium, but there is great assurance that America is finding herself upon the road to secure social satisfaction with the preservation of private industry, initiative and a full opportunity for the development of the individual."

mobile business were to prosper. "After Congress has passed the present tariff law, the Chamber of Commerce should undertake a study of the economics involved in the world tariff picture," he said. "Such a study would serve to guide future considerations of an increasingly important phase of the industrial life of the nation."

Mr. Rice reiterated the stand of other automobile executives taken on this subject, and presented last week in *Automotive Industries*, in his discussion of the tariff and of the need of a new economic point of view in dealing with the "crux of the export situation today."

W. Irving Bullard, of the E. H. Jacobs Mfg. Co., and chairman of the Committee of Aeronautics of the Chamber of Commerce of the United States, said that exports of powerplants, parts and completely assembled airships would show a large increase in 1930 over the record year of 1929.

"Refinement of design has given American manufacturers tremendous prestige in the airplane field, just as refinement in design has made American automobiles a dominant factor throughout the world.

"Because American capital has been generous in supplying funds for development, because our government has been a leader in exercising care in licensing types of powerplants, and because manufacturers have been so careful in testing their products to prevent failures, the world is looking to us for their airplane needs," he said. "The experience of successful automobile manufacturers in manufacturing, merchandising and servicing is available to the airplane industry. If we follow the pace set, we will be equally successful."

Price, according to several speakers who have had wide export experience, has generally been a second consideration on the part of foreign purchasers of commodities. Quality, design and style of American products usually find them selling in preference to cheaper European and Asiatic products, William C. Redfield, former Secretary of Commerce, and now president of the Brooklyn National Bank, New York, said.

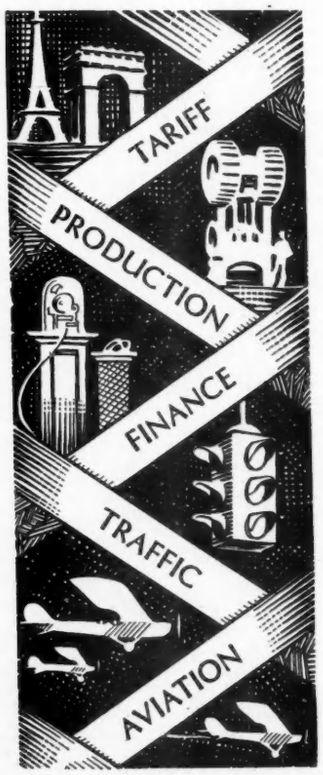
"The most important factor, however, is world goodwill if we are to get any appreciable share of world trade. If we do not get an increasing volume of world trade, we are not going to keep our factories busy at home, because engineers have increased our productive capacity many fold since the beginning of the present century. The impetus of the war left us with facilities for great production capacity in every industry," he said. "We can only obtain efficient use of these facilities through export."

Motor truck manufacturers generally are looking across the seas for an increasingly large volume of their business, Thomas R. Lippard, president of the Stewart Motor Truck Corp., Buffalo, told the conference. He pointed out that many manufacturers have been doing experimental work in the foreign markets, but felt that those who had any experience in this field are enthusiastic about the possibilities of extending their export business.

"Some truck companies show a large percentage of their business as exports. Other companies, such as ours, have found their preliminary business very remunerative and are planning to increase export efforts. We have found nothing mysterious in export business. This type of our business is as simple, satisfactory and equally as profitable as our domestic business." He said that the Department of Commerce has been of great service in supplying information about shipping and merchandising in foreign countries, and suggested that exporters take more advantage of this department.

Advertising is one of the essential factors in export, according to spokesmen for the Department of Commerce and several manufacturers who have had success in merchandising abroad. E. A. Baldwin, vice-president of the International General Electric Corp., said that sales volumes of a given item in various countries frequently show a direct relationship to the amount of advertising done in each of these countries. "Advertising is one of the contributing factors to goodwill, and goodwill will sell commodities in the face of higher prices and poorer deliveries in some cases."

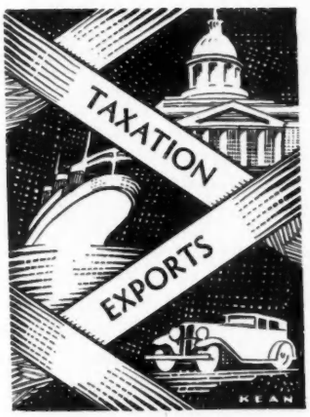
William L. Cooper, director of the bureau of foreign and domestic commerce of the Department of Commerce, told the conference that the "world grew poor because of over-production in all manufacturing lines at the time when world crops were breaking records for productivity." An abundance of food, labor and stocks of manufactured goods met with disconcerting effect on the world markets, he pointed out, but the net result is the healthy economic condition brought about by lowered costs of production.



"The downward trend of exports has been checked, as of April 15, with France and the United Kingdom leading in importing American goods," he said. "The financial markets of the world are now adjusted to generally lower interest rates, ranging down to 3½ per cent. This is one of the hopeful signs for a good year in 1930," he said.

He found that low prices do not mean depression—providing manufacturing has successfully lowered production costs. Mass production has effectively eliminated a tremendous waste which heretofore had been taken for granted. Thus the buying power of the world had been partly diverted to other things than necessities, raising the standard of living.

"It is true of civilization that once a high standard of living has been achieved, people will strive to maintain and improve this standard. This means that the long-haul outlook for the United States is particularly bright. It means, other things being equal, that we are going to be able to sell more of our manufactured and agricultural goods abroad." Although the purchasing power of the world has been diminished in this period of general recession, standards of living have not suffered. The world will be a ready market as soon as conditions abroad improve, he held.



Five main reasons for establishing plants in foreign countries were brought out at the export conference session. They were:

Overcoming foreign tariffs.

Protecting patent rights abroad by manufacturing in foreign countries.

Equalizing the opportunity to merchandise goods by overcoming the natural patriotic objection to imported goods on the part of large portions of foreign populations.

Reducing prices on foreign markets.

Manufacturing in close proximity to the market to compete with native manufacturers in servicing requirements.

Mr. Redfield pointed out that the effect of establishing branch plants, using some foreign capital, and as much foreign labor and materials as possible, has contributed largely to the increased buying power of other countries.

"It follows that export volumes of goods manufactured here will show an immediate decrease, but increased sales from branch factories soon make up for the slump and sales volumes are not long in climbing to new heights," he said, recounting the experience of General Motors, Ford, International Harvester, Aluminum Corp. of America, Budd and other manufacturers who have developed foreign manufacturing facilities.

The Chamber has advocated the use of air transportation to afford more rapid postal service, and welcomes the legislation which is being enacted for enabling the postmaster general to place contracts for air transportation of mails for adequate periods on a basis of compensation equitable for the service rendered, and to further advance and encourage the development of the country's air transportation system.

It was further advocated that legislation for this purpose should be kept current with the progress of air transportation, including service overseas as needed for our business and development of our foreign trade.

The importance of uniformity throughout the country in laws and regulations affecting civil flying has been emphasized before by this organization. Much progress has been made by the states in enacting legislation suitable for this purpose. It was urged that states which have not yet enacted legislation requiring Federal licenses for aircraft and air men engaged in intrastate flying, in order that uniform and high standards may be applicable in all parts of the country, should now enact laws conforming to the recommendations of the Department of Commerce.

The report of the resolutions committee read, "Continued development of airports and airways is vital to the efficiency and safety of air transportation, and should be encouraged by state and Federal governments, including the services of weather reporting, radio direction and communication. To further uniformity in airway markings, lighting and other means of identification, and more efficient and safer use of airports and airways, it is recommended that a conference be called by the Secretary of Commerce at an early date to consider the laws, regulations and practices relating thereto, including local enforcement."

The Sixth International Conference of American states meeting at Havana, Cuba, February, 1928, recommended to the several countries of the Pan-American Union that steps should be taken immediately looking forward to the construction of a great inter-American highway in the interest of closer relations between the peoples of the new world.

Canada Speaks on Tariff

ADMITTING the difficulty of estimating in advance the effect of the new American tariff upon Canada, Colonel J. H. Woods, president of the Canadian Chamber of Commerce, asserted that nevertheless it was now believed Canada would be damaged in her American trade about $75,000,000 annually.

"This may not seem a great amount to you, but to a country which buys from you about $800,000,000 a year and which at present only sells to you about $400,000,000, the cutting off of 20 per cent of that trade is of importance.

"It is not, however, to the loss of trade that I refer. It is rather to the spirit by which that loss of trade is being brought about."

All-Addendum Teeth Pinions for Proposed at A. G. M. A. Meeting

Machine tool industry heralded as one of the leaders by E. F. DuBrul in economic survey

PINION teeth for phenolic laminated gears that are all addendum or whose working portion is located entirely above the pitch line are an innovation proposed at the fourteenth annual meeting of the American Gear Manufacturers Association, which was held at the Gibson Hotel, Cincinnati, May 1, 2 and 3. The proposal was made in a letter from Earle Buckingham, associate professor of mechanical engineering at Massachusetts Institute of Technology, which was read by H. R. Moyer, chairman of the Committee on Non-Metallic Gearing. A gear for use with such a pinion would have teeth that are all dedendum, and a pair of gears proportioned in accordance with this recommendation are said to permit of taking full advantage of the peculiar physical properties of this non-metallic material.

An interesting talk on photo-electric cells was given by L. R. Koller of the General Electric Co. Other papers and addresses presented at the meeting related to Symbols for Gear Terms, Load and Speed Conditions of Worm Gear Drives, and the Outlook for New Developments in the Machine Tool Industry.

At the banquet, held on Friday evening, Fred A. Geier, president of the Cincinnati Milling Machine Co., spoke on some of the achievements of Cincinnati in the fields of education and industry, and on business conditions, while Prof. W. P. Calhoun of the Department of Finance of the University of Cincinnati developed the theory that low interest rates are not a sure cure for the present industrial depression. E. S. Sawtelle of the Tool Steel Gear & Pinion Co. acted as toastmaster.

Four members were elected to the Council, namely, A. F. Cooke of the Fawkus Division of Gears & Forgings, Inc.; F. W. England of the Illinois Tool Works; W. G. Jones of the W. A. Jones Foundry & Machine Co., and A. A. Ross of the General Electric Co. Henry E. Eberhardt of the Newark Gear Cutting Machine Co., one of the oldest members of the Association, was elected honorary member of the Council for life. The Council elected the following officials for the coming year, whose election was announced at the banquet: B. F. Waterman, engineer of Brown & Sharpe Mfg. Co., president; E. W. Miller, chief engineer of Fellows Gear Shaper Co., first vice-president; John Christensen, Cincinnati Gear Co., second vice-president; Warren G. Jones, W. A. Jones Foundry & Machine Co., treasurer. Tom Owen remains as secretary of the Association.

Nomenclature Proposals

One of the first papers to be presented was that of Allan H. Candee, of the Gleason Gear Works, on Symbols for Gear Terms. In connection with the report of the Nomenclature Committee it was proposed and favorably acted upon that in future editions of A.G.M.A. standard nomenclature sheets the present A.G.M.A. symbols be printed under the heading "Abbreviations," and that a new column under the heading "Symbols" be introduced, in which the symbols suggested by Mr. Candee, or symbols conforming to the principles advocated by him, be inserted.

Final action on some of these nomenclatures has been held up, however, because it is felt that in some cases at least the same term can be used for all forms of gearing. Mr. Waterman in making his report for the general Standards Committee also referred to the subject of nomenclature. He pointed out that the present A.G.M.A. "symbols" have been used successfully in standardization work. Non-uniformity, he said, indicated that further serious thought should be given to the subject of gear nomenclature.

Prof. Earle Buckingham, in a letter read by H. R. Moyer of the Non-Metallic Gear Committee, said non-metallic gears should be considered in a class distinctly apart from metallic gears, because of the widely different physical characteristics of the two classes of material.

The tensile strength of phenolic laminated materials used for gears is slightly less than that of cast iron, and the material is far softer than any metal, while its modulus of elasticity is only about 1/30 that of steel. In other words, if a tooth load deforms a steel gear 0.001 in., it will deform a non-metallic gear tooth 1/32 in.

Under these conditions several things will happen. With all gears, regardless of the theoretical duration

THE THREE-YEAR CYCLE

ONLY twice in 30 years has there been any deviation from the three-year cycle in business activity, according to E. F. DuBrul, General Manager, Machine Tool Builders Association. Industry, he said, should adjust production to this well-defined indication of the public's buying habits.

Laminated Gears

By P. M. HELDT

of contact, one tooth only will carry the load until this load is sufficient to deform the tooth the amount of the error that may be present. On well-made commercial gears of 6 diametral pitch and finer the average normal error will be about 0.002 in. On very carefully cut gears this error may be reduced about one-fourth.

On metal gears, when the tooth has been deformed the amount of this error, the stress set up in the material may approach or exceed the elastic limit. Hence, for standard tooth forms and those generated from standard basic racks, it is dangerous to calculate their strength as very much greater than that which can be safely carried on a single tooth.

On gears made of phenolic laminated materials, on the other hand, teeth will deform the amount of this error without setting up any appreciable stresses, so the load is actually supported on several teeth. Considering this condition alone, it would be safe to introduce a contact factor in the Lewis formula for strength, and this contact factor would be generally larger than the theoretical duration of contact in terms of tooth intervals, because the actual points of contact on successive teeth will vary from near the tip to near the root of the active profiles. Also, when the theoretical duration of contact is less than two teeth, actually three or more teeth may be in simultaneous contact because of the deformation.

Deformation Leads to Cutting

But this deformation also introduces another condition. Assuming a non-metallic driving pinion of the conventional tooth form, when the deformation becomes appreciable, the corner of the entering tooth of the metal-driven gear will make premature contact and start to cut or scrape a free path for itself into the flank of the non-metallic pinion. This condition is also present, but to a much lesser extent, on metal gears when the wear is excessive. The path of the corner of the driven gear, as it sweeps into and out of engagement below the pitch line of the pinion, is in the form of a loop known as a trochoid. Thus, such worm tooth forms tend to have a profile of double curvature. The same condition is present when a hob or other generating tool extends so far below the base circle of an involute that under-cutting takes place. As a matter of fact, the fillet on any generated gear, whether undercutting takes place or not, is primarily of the same trochoidal form. Hence, the additional contact of non-metallic gears is of no practical value when it must be accompanied with this under-cutting, because of the deformation and scraping action of the entering tooth of the metal gear. This will not only cut away part of the active profile but will also weaken the tooth, thus permitting additional deformation and additional cutting, and eventually it will produce failure.

For non-metallic driving pinions it is possible to minimize this condition of cutting, but only by departing from conventional gear proportions. In other words, in order to obtain the full benefits of the peculiar physical properties of the phenolic laminated material, it is necessary to design the gear teeth themselves to favor the behavior of the material and to minimize the detrimental influence of the relatively large amount of deformation. This can be done by making the teeth of the non-metallic driving pinion all addendum, while that of the metal driven gear is made all dedendum. In other words, the pitch circle of the non-metallic driving pinion should be at the bottom of the working depth, while that of the metal-driven gear is at its outside diameter. In this case the path of the entering corner of the tooth of the metal-driven gear in relation to the non-metallic driving pinion will be in the form of a cycloid, a form of path which will have but little tendency to cut away the tooth of the pinion.

Such a procedure does not require the introduction of any new form of rack. Any of the present standard ones may be used. For many reasons the 20-deg. stub-tooth form would appear to be the logical selection. This form would give the smallest all-addendum pinion and smallest all-addendum gear with favorable tooth shapes. It is also the strongest form of the standard ones and would thus favor the low tensile strength of the material.

To summarize, for replacement gears where standard tooth forms and proportions must be maintained,

B. F. Waterman, Brown & Sharpe Mfg. Co., who is the new president of the A.G.M.A.

no contact factor should be used in the Lewis formula when applied to the calculations of the safe loads of phenolic laminated gears. For driving pinions of this material of all-addendum forms, contact factors varying from about 1.5 to 4 may be safely used. In other words, by modifying the design of such driving pinions to favor the peculiar physical properties of these materials, several times the load that is safe with conventional design may be safely transmitted.

The results of an endurance test recently completed seem to indicate that when the driven gear is of non-metallic material and of conventional design, no contact factor should be used. With heavier loads than calculated on the basis of one tooth carrying the full load, the surface of the non-metallic driven gear above the pitch line appears to be subjected to excessive scraping. It would be desirable to make further endurance tests of such gears where the driving member is of the all-addendum form. All that is needed to conduct such tests is suitable samples.

Emil Dukes of Gear and Forgings, Inc., presented a paper on Load and Speed Conditions of Worm Gear Drives. This was really the second part of a report on an investigation on worm gear operating conditions, of which the first part was presented at the fall meeting in Philadelphia last year. Mr. Dukes' paper consisted essentially of two parts, the first being a derivation of equations for the area of contact and for the maximum compression stress induced when a cylinder is pressed against a flat surface and when two cylinders are pressed together. Mr. Dukes hopes to be able to derive equations for the maximum compression stress in the teeth of worm gears in terms of the tooth load and the dimensions of the worm and gear teeth, but has not succeeded so far. The second part of the paper related to tests on a number of worm gears of the industrial type, to determine their load capacity. These tests were made at the Case School of Applied Science, Cleveland.

A $3,000,000,000 Business

E. F. DuBrul, general manager of the Machine Tool Builders Association, pictured the importance of the machinery industry to our present civilization. Machine tools are the master tools of industry, and the machinery industry is the most important industry in this country. The American machinery business has a turnover of $3,000,000,000 per year, he stated.

Mr. DuBrul pointed out that although there are some twenty associations tieing together particular groups of the machinery industry (of which the A.G.M.A. is an example), there is no general organization representing the interests of the machinery manufacturers, as there is in the lumber industry and in the paper and pulp industry. He felt that the machinery industry needed such a general organization.

Turning to the subject of likely developments in the machine tool industry, the speaker said they were of two kinds, technical and commercial. At present the machine tool industry is undergoing another revolution, which is due to the introduction of tungsten carbide cutting alloy. This permits of cutting metals at a much more rapid rate than has been customary heretofore, and nobody knows as yet what are the limits of cutting speed with this material.

A machine should be designed for the use of tungsten carbide tools which has far greater rigidity than present lathes. For the design of such a machine a man with imagination would be needed, not a regular machine tool designer, who would be too much handicapped by tradition.

As regards the commercial phase of the machine tool industry, the speaker said he felt the returns obtained were far too low. Those in the machinery business do not make profits which are anywhere in proportion to their contributions toward the progress of civilization. The year 1929 was certainly a boom year for all lines of business, and if machine tool manufacturers during that year could not make more than 15 per cent on their invested capital there was something wrong somewhere. One of the bugbears of the machine tool industry was the great fluctuation in the demand for its products.

Degrees of Employment

A great many figures on degrees of employment in the machine tool industry were given in the course of the talk. A great boom was experienced in 1919 and 1920, and another in 1928 and 1929, while the seven years in between were comparatively slack. During 1928 the industry worked at normal full capacity with a single shift, while in 1929 orders averaged one-sixth above this normal full capacity and called for the working of night shifts. On the average, employment in the machine tool industry was equal to only two-thirds of full normal capacity with a single shift.

It has been found that all business follows a three-year cycle, and during a 30-year period there has been a deviation from this three-year cycle only twice. The machine tool industry cannot change the buying habits of its customers and it should adapt itself to this three-year cycle. There have seldom been such severe fluctuations in the business as during the last quarter of 1929, when business fell off 50 per cent in two months.

An analysis of the annual statements of 26 machine tool companies who are said to represent the "cream of the industry," revealed that over a 10-year period their profits, on the basis of book values, average only 7.6 per cent, and this Mr. DuBrul considered entirely inadequate. The actual replacement values of the properties are much higher, and these should be made the basis for the determination of profits. Booms are an evil because they are followed by depressions. One of the large corporations of the country has set 15 per cent on the invested capital as the minimum for its divisions, and Mr. DuBrul suggested that if machine tool builders were to keep above this minimum they would have to show an average of considerably more than 7.6 per cent on the present basis of calculation.

Friday afternoon was spent in a bus trip through the residential sections of the city and some of the industrial suburbs. On this trip the plant of the Formica Insulation Co. and of the Cincinnati Milling Machine Co. were visited.

Committee Reports

Reports were made by a number of sub-committees of the Standards Committee, but most of these were of the nature of progress reports. George M. Bartlett, chairman of the Sprocket Committee, made a report on roller chains and sprockets for same which is identical with the work on this subject presented at the Standards Committee meeting of the S.A.E. in January last and is therefore familiar to our readers. The Gears and Pinions Committee presented a large table for the determination of load capacities of spur gears, or, rather, the determination of suitable dimensions for gears for transmitting definite horsepowers at definite speeds. Some objections were raised to parts of this table, which gave illogical combinations of bores and diametral pitches. A lengthy session of the Herring-

bone Gear Committee was held, which was attended by F. A. Mickle, professor of mechanical engineering at the University of Michigan, who had criticized some of the provisions of the recommended practice on herringbone gears. It has been found impossible to go very far in the standardization of this form of gearing. The number of companies producing herringbone gears is limited; their practices with regard to such items as pressure angle and helix angle differ considerably, and there appears to be little inclination on the part of any of them to give up their established practice, hence the A.G.M.A. recommended practice merely sets limits for these and other factors instead of assigning definite values to them.

No action was taken with regard to the fall meeting, but the Executive Committee will meet in about 14 days, when it is expected the place and date for this meeting will be decided upon.

Plymouth Increased Engine Stroke Gives Plant Rating of 46 hp.

NEW bodies, almost entirely of pressed-steel construction and increased power, are to be found on the Plymouth cars now being shipped. The new bodies, produced by Briggs, follow the lines of the recently introduced low-priced Chrysler Six; they have French roofs with metal roof side-panels, a military front, all-steel doors, and a new molding treatment.

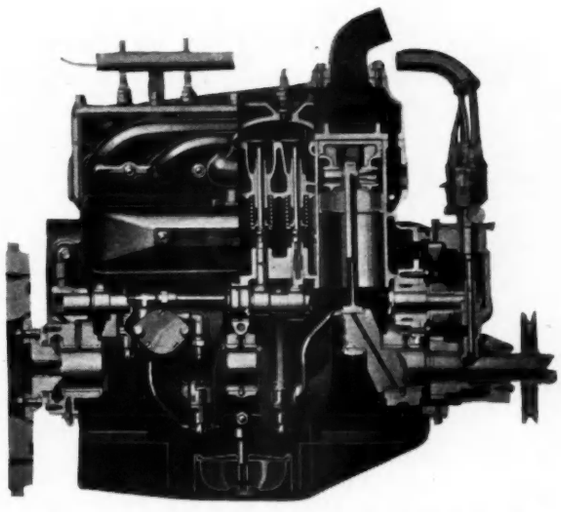
From the cowl forward further changes are to be noted. The narrow radiator shell, formerly characteristic of the Plymouth and other Chrysler cars, has been replaced by a wider shell of new and distinctive outline, chrome-plated, as are other exposed metal parts.

The adoption of a larger crankshaft throw, increasing the stroke of the Plymouth engine to 4¾ in., has increased the maximum power of the Plymouth engine at lower speeds. The bore remains 3⅝ in. The new rating is 46 hp. at 2400 r.p.m. The piston displacement being 196 cu. in. and the compression ratio 4.6 to one. Crankshafts are somewhat heavier, the new weight being 43¾ lb. Connecting rods measure 8 9/16 in. in length between centers. A further mechanical change is found in the starter engagement which is now of the mechanical-shift type. Electrical units are obtained from two sources, Northeast and Delco-Remy.

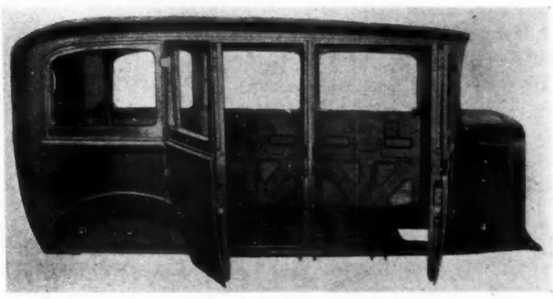
Since there has been no change in the tire size and the rear axle ratio, the higher power at lower engine speed should result in improved get-away.

New features inside the bodies include a three-spoke steering wheel, rubber covered and with a steel core; individual mounting of instruments on the dash, with indirect lighting, and the adoption of an electric dash gasoline gage. A diaphragm-type horn of Moto-Vox manufacture is mounted on the headlamp tie bar in front of the radiator.

Other Plymouth features which are continued unchanged include the Oil-Vac device which shuts off the gasoline supply when the oil level in the crankcase drops to a dangerously low point, four-wheel hydraulic brakes, pressure engine lubrication, and aluminum alloy pistons.



Power has also been increased in the new Plymouth, which now develops 46 hp. at only 2400 r.p.m. This has been obtained through the use of a longer stroke, now 4¾ in., increasing the displacement to 196 cu. in. Connecting rods are now 8 9/16 in. long



Bodies not only look, but are different. This view of the body structure shows to what extent all-steel construction has been adopted. Bodies are manufactured by Briggs

Three Master Gears Employed for

Process is developed in which definite relation with its apex wise to move and find its

By CHARLES H. LOGUE

SINCE the introduction of spiral bevel gears in 1914, the attention of both production men and gear manufacturers has been focused on improvements in the manufacturing process, all directed toward the production of accurate, quiet-running gearsets. It is well known, of course, that present methods of generating spiral bevel gears produce a tooth surface composed of a large number of microscopic flat surfaces, which if magnified would appear somewhat as sketched in Fig. 1. And it is the action of these flats which is responsible for the noises in automobile gearsets.

With a full realization of these facts two different methods are variously used in an attempt to produce a smoother tooth surface. In one of these methods the soft pinion is run in with a hardened ring gear; in the other, the hardened pinion is lapped by running it in with its mating gear, using an abrasive as a lapping medium. Apparently, neither of these methods has been absolutely successful.

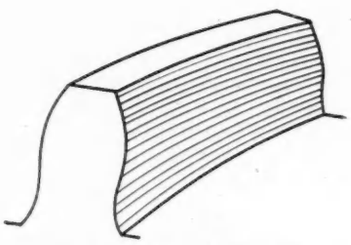


Fig. 1—Magnified section of a tooth face showing microscopic flats

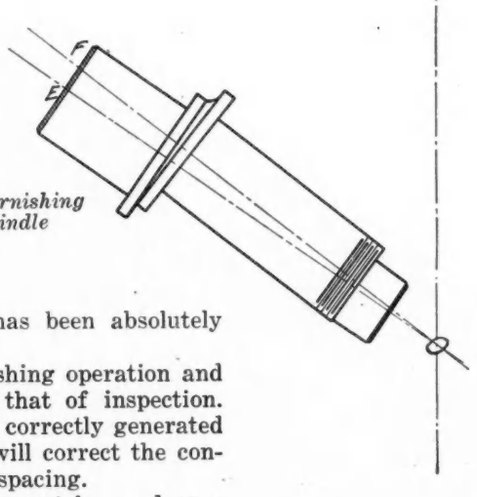


Fig. 4—Detail of burnishing gear eccentric spindle

The main function of the burnishing operation and the machine employed should be that of inspection. The ideal burnisher will improve a correctly generated pinion, will remove the flats and will correct the contour of the teeth as well as their spacing.

Moreover, since the burnisher cannot be used as a generator for cutting pinions, it will not improve an incorrectly cut pinion, and by this means it will serve as an accurate check upon the adjustment, setting and operation of the gear generator. Consequently, a good burnishing process will produce better mating gears as well as provide an accurate check on the production process.

Years of research, dating back to the introduction of spiral bevel gears, have resulted in the final development of a burnishing process which closely approaches our specifications of what constitutes an ideal gear burnisher. In this machine the soft pinion is burnished by running it in conjunction with three master gears. In the process the pinion is constrained to a definite relation with its apex point, but is otherwise free to move and find its own natural operating position between the three master gears. The angular velocity of these three master gears is uniform, due to their overwhelming relative mass and in turn this uniformity is impressed upon the pinion as mutual pressure is applied.

It might be well to note here that the rolling of one or all of these burnishing gears about the common apex point corresponds exactly with changing the distance between centers for spur or helical gears, similarly arranged. Rolling all three burnishing gears into engagement at exactly the same rate would hold the pinion in a vertical position, but there is no more need for this than there is for engaging the spur gear in some particular plane when employing the triangular spur or helical gear burnisher.

A view of the new bevel pinion burnishing machine introduced by Hersam & Sherwood, Inc., Philadelphia, Pa., is shown in Fig. 2. Fig. 3 shows in complete detail the important elements of this machine. Of the three burnishing gears *A*, *B* and *C*, gear *A* is belt-driven from a countershaft at the base of the machine and can be rotated in both directions. Gear *B* is free to rotate on the stud while gear *C*, also free to rotate, is mounted on a conical eccentric, whose alignment is adjustable by means of a hand lever. Incidentally, the stud on which gear *B* is mounted is also made eccentric to compensate for adjustment after initial wear has taken place in the burnishing gears.

It is apparent that a standard set of burnishing gears cannot be included with the burnishing machine, as they are intimately related to the individual manufacturer's requirements. As a rule, the burnishing gears should be made by the gear manufacturer and supplied to the machine builder who will install them in the burnisher and test the operation of the set-up before shipping it. The pitch diameter of the burnishing gears is usually about seven-tenths of the pitch diameter of the ring gear with which the pinion meshes in the gearset. On the other hand, the face of the burnishing gears is made somewhat wider than the ring gear and the pinion to prevent shouldering.

Each burnishing gear is bolted to a heavy flywheel to increase its inertia so that the resulting uniform angular velocities of these overwhelming masses may be impressed upon the pinion and correct the spacing and profiles of its teeth as the burnishing is accom-

Burnishing Pinions

the pinion is constrained to a point, but it is left free other- own natural operating position

and CONRAD O. HERSAM

plished. Since the pinion is rolled freely between the three burnishers which exert equal pressure, its velocity is eventually controlled by that of the burnishing gears.

A detail of the conical eccentric employed to move the burnishing gears about their common apex *O* is shown in Fig. 4. It is apparent that the axes *OF* of the eccentric and sections having the axis *OE* which are journaled in the head of the machine, have a common point of intersection at *O*. Moreover, it will be noted that by rotating the eccentric in a bearing or about axis *OE* the angular relation of the axes *OE* and *OF* is changed in any given plane, thus imparting to a gear whose axis coincides with *OF* an angular movement about the apex *O* limited only by the angular relation of the axes *OE* and *OF*. There is but one restriction to the pinion alignment, namely, that equal pitches must be engaged, thus specifying a definite relation between the apex point of the burnisher set-up and the pitch diameter of the pinion. In practice, the distance from the apex to the pinion hub or shoulder must be the same as the similar setting on the gear generator.

Fig. 2—Bevel pinion burnishing machine recently developed by Hersam & Sherwood, Inc., used in the operations described in the accompanying article

The overhead supporting arm *F* may be approximately located on the vertical column and micrometers are provided in the stop *G* against which the slight upward thrust of the pinion is taken. In Fig. 3 the stem pinion is shown with a sleeve adapter *H*, giving a fixed distance between the back pinion shoulder and the stop *G*. Lacking this sleeve it would be necessary to hold the pinion length from shoulder to end very accurately. Since the location of the small end of the pinion is of no importance a spring and plunger are provided to support the pinion against the upper stop *G*.

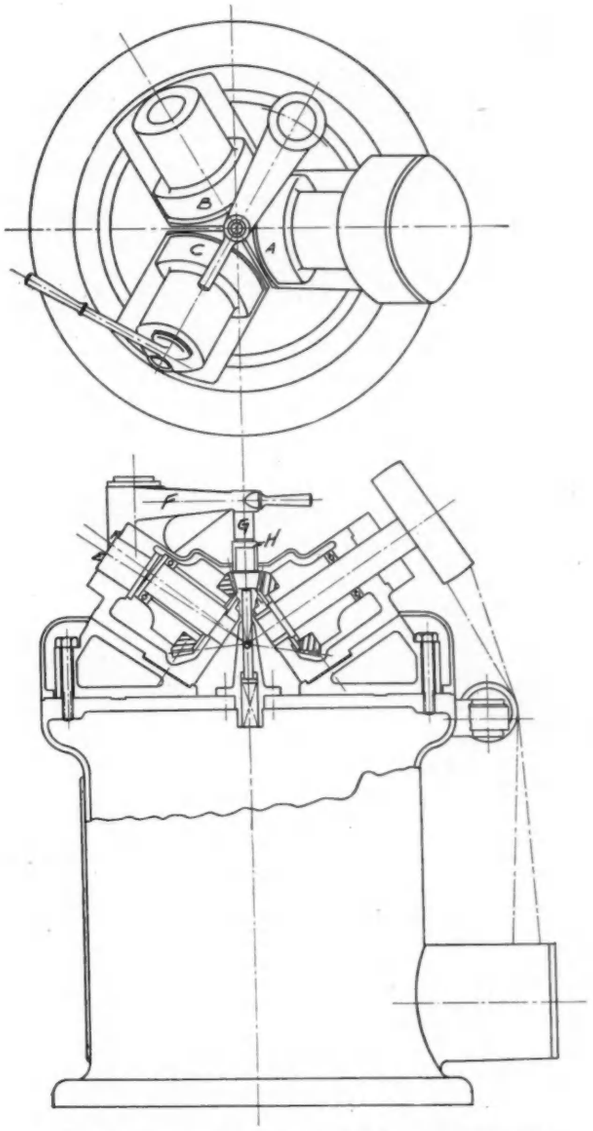


Fig. 3—Sectional view through burnishing head

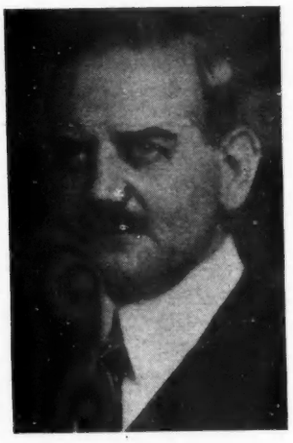
When operating the burnisher, the vertical position of the pinion is of no importance. The correct relation at the top of the sleeve *H* will assure a fixed back cone pinion distance, as this is the only important element. The pinion may otherwise take any position required by its engagement with the burnishing gears.

This machine is provided with pressure feed lubrication arranged so that the coolant may be fed freely to the pinion. Experience has shown that ordinary cutting compound, particularly one employing oil with a lead base, will give best results. Red or white lead mixed with oil will also make an excellent lubricant for this purpose. Oil is not recommended, as its action is harsh and produces a poorly finished surface, although it will materially reduce the burnishing time.

The machine is driven by a 3 hp. motor with gearing arranged to provide a speed of about 200 to 300 r.p.m. of the burnishing gear spindle. This speed is adjustable and should be varied according to the size of the work and other special considerations. It is expected

(*Continued on page 737*)

Association Award Won by N. A. C. C. for Cross-Licensing Patent Plan



Alfred Reeves, general manager N.A.C.C., who received the award

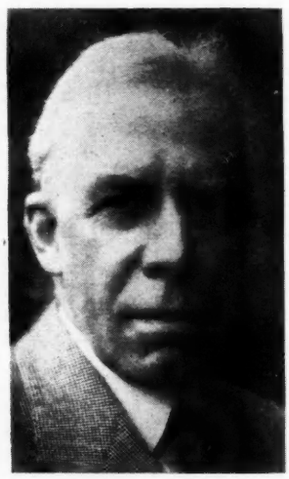
C. C. Hanch, who, as chairman of the first patent committee of the N.A.C.C., was largely instrumental in organizing the patents cross-licensing agreement of the industry

IN awarding the bronze medallion of the American Trade Association Executives to the National Automobile Chamber of Commerce, the committee cited the latter's cross-licensing of patents agreement as one of its outstanding services to the public. This is the first award made by the Trade Association group, and in making the selection considered achievements of associations for the past 10 years.

Secretary of Commerce Robert P. Lamont, in making the presentation of the award to Alfred Reeves, general manager of the N.A.C.C., said that this pooling of patents, which now totals more than 17,000, has resulted in great public benefit by allowing each manufacturer to use the latest improvements originated by any company. It works a step in advance of most associational work, and is of dominant importance because of the magnitude of the automobile industry and the strength of the association representing it.

"We decided that we would give first importance or greatest weight to the public benefit derived from the associational achievement. The other two requirements for the award—benefit to the particular industry, and to industry as a whole—were ranked lower on the assumption that almost all efforts were directed to these ends.

"The difficulties encountered in determining the association most deserving of recognition were complicated for this year of award by the decision of the donor and the Committee of Award of the American Trade Association Executives that any associational activity continued in force since 1920 should receive consideration. This, of course, widened the field of review immeasurably, and practically required the jury to select the achievement most representative in all trade association history."



Fred J. Haynes, president of Durant Motors, Inc., who for several years has been chairman of the cross-licensing committee of the N.A.C.C.

Robert A. Brannigan, who is in charge of the patent work of the N.A.C.C.

The excellent record of the Patent Department of the N.A.C.C. would not have been possible without the efficient library facilities which have been growing over a period of 15 years under the direction of W. L. Powlison. The magnitude of the work undertaken in the library is indicated in the recent announcement that Mr. Powlison had completed the examination of his 500,000th patent text in order to determine whether it contained anything of automotive interest.

In considering the fact-finding, research and dissemination of information, the jury found that the N.A.C.C. has made a practice for years of gathering statistics of production and has made these figures available to the entire membership.

Mr. Reeves gave credit to automotive trade publications for giving manufacturers and dealers "a clear, accurate picture of the weekly and monthly condition of business, with able interpretations of trends and outlooks."

He pointed out that "many industries are recognizing the value of fact-finding more than ever before. President Hoover has given great impetus to this point of view. Steel, paper, cotton goods and other manufacturers are among those who have for many years recognized the value of facts in reducing the guesswork in business. The tendency is strongly toward increasing this type of information.

Higher merchandising costs reflected in lower earnings are due partly to factories' efforts to

Stabilizing the Industry

By NORMAN G. SHIDLE

FACTORY production kept strictly in line with retail sales—

DEALERS given a chance to liquidate new and used car stocks—

CONTINUANCE of vigorous merchandising effort in the face of adverse economic conditions—

STEADY realignment and reequipping of plants for even more efficient manufacturing—

COURAGEOUS effort to hold sales up and production costs down—

All of these stabilizing, constructive activities are reflected as part of the general program of automobile manufacturers in the earnings statements which have begun to come through for the first quarter of 1930.

Net earnings of passenger car manufacturers for the first quarter of 1930 were definitely behind those of the first quarter of 1929 as was generally expected. With the possibility of only one or two exceptions, the final figures will all show up unfavorably as compared to those of the January to March period of last year. But this unfavorable showing must be attributed in some measure to the determination of executives to take whatever medicine may be necessary to make 1930 a year of really fundamental stabilization for the industry as a whole. It cannot be attributed entirely to the smaller demand for automobiles.

While refraining from forcing cars on dealers, manufacturers generally are proceeding with greater rather than less sales, service and accounting help for distributors and retailers. Despite relatively low sales, they are building courageously for the future, thus demonstrating practically their abiding belief in the greater opportunities which lie ahead.

No tendency is being exhibited to cramp permanently sound development programs in an effort to make earnings statements look better temporarily. There is a strong trend toward bringing the industry back to a sound basis as quickly as possible, even though immediate profits statements may be made to look even worse than otherwise by reason of such procedure.

Figures for 1930 first quarter earnings of eleven passenger car companies are available as this is written. Of those thus far reporting—General Motors, Chrysler, Peerless, Pierce-Arrow, Hudson, Hupmobile, Nash, Packard, Reo, Studebaker and Willys-Overland—two of the largest have more than earned their quarterly dividend requirements, while three or four of the others have fallen short by no irretrievable margin. Peerless, without an established dividend rate, shows increased earnings over last year, while production decreased.

In every case except one—Nash—the percentage decline in net earnings this year as compared to last has been greater than the percentage decline in units produced.

Actions already taken and rumblings of future moves portend a number of modifications of dividend policies among passenger car organizations. It seems likely—and quite reasonable—that stockholders will be asked to share in burdens arising from necessary merchandising and manufacturing readjustments during this period of return to stability through which the industry is passing at the present time.

FIRST QUARTER PROFIT TREND

Name	Quarterly Div. Rate	Earnings Per Share 1st Quarter		Actual Earnings 1st Quarter		Per Cent Decrease Actual Earnings 1st Qtr. 1930 from 1929	Per Cent Decrease Production (Jan.-Feb.) 1930 from 1929
		1930	1929	1930	1929		
General Motors	$0.825	$0.98	$1.37	$44,968,587	$61,910,987	27.4	16.3
Chrysler	0.75	0.04	2.00	180,717	8,838,173	97.8	39.0
Hudson	1.25	1.45	2.86	2,316,945	4,567,783	49.3	20.6
Hupmobile	0.50	0.04	1.02	66,749	1,501,595	95.5	45.5
Nash	1.50	0.65*	1.51*	1,782,512	4,118,870	56.7	67.2
Packard	0.25	0.17	0.47	2,654,247	7,114,000	62.7	39.2
Peerless	...	0.36	0.09	93,485	23,833	+296.0(1)	—63.4
Pierce-Arrow	...	0.70	0.68	461,401	448,532	+27.0(1)	+93.4(1)
Reo	0.20	0.09†	0.27	—175,437†	537,514	131.5	...
Studebaker	1.00§	0.62	2.36	1,492,137	5,033,589	70.4	35.7
Willys-Overland	0.30‡	0.40†	0.58	—136,443†	2,028,000	106.9	74.2

* Quarter ended Feb. 28.
‡ Common dividend due May 1, 1930, passed.
§ Annual rate reduced to $4 from $5, April 30, 1930.
(1) Gain.
† Loss.

Stock dividends, for example, bid fair to go the way of all flesh in more than one instance. Studebaker discontinued this form of dividend last fall and Hupmobile has followed suit more recently. Probably we have not yet seen the last example of this particular policy change.

Thus far there has been only one instance of a passed dividend and little further danger looms in that regard. That the regular dividend payments to common stockholders will be reduced in more than one instance before the year is out seems almost certain. But such action may indicate the previous establishment of too high a rate, rather than the inability of the particular organization to earn fair returns on capital invested or gross sales.

As indicated in *Automotive Industries* of March 8, there are, in addition to the general business situation, some 8 or 10 pressures this year exerting a downward thrust on profits of car manufacturers. These include such items as junking plans, pressure to bear with dealer share of labor cost of replacing defective parts, pressure to pay freight on defective parts shipments during standard warranty period, pressure to rebate dealers on models in stock at time of price cuts, pressure to make adjustment to dealers on old models in stock at time of new model announcements, need for greater assistance to dealers in merchandising, accounting used car and other problems, and so forth. These pressures, many of them small in themselves, undoubtedly are helping to hold current passenger car profits to relatively lower levels than last year. Put together, these pressures, while still not constituting a dominating factor, do warrant recognition in any analysis of the profit probabilities during 1930.

On the favorable side of the ledger, so far as passenger car profit outlook is concerned, can be listed:

1. Definite strengthening of effort by car manufacturer to recapture greater share of replacement parts.

2. Gradually improving sales situation, which gives evidence of making last half of 1930 almost equal to that of 1929. The last quarter of 1930 may well be ahead of the last three months of 1929.

3. Continued increases in production economies.

FIRST QUARTER INDUSTRIAL CORPORATION PROFITS

and

Percentage Return on Capital and Surplus

(Courtesy, National City Bank of New York)

No.	Industry	Net Profits (000's omitted)		Per Cent Change	Capital and Surplus (000's omitted)		Per Cent Return	
		1929	1930	1929-30	Jan. 1, 1929	Jan. 1, 1930	1929	1930
4	Amusements	$7,115	$10,910	+53.3	$172,395	$215,400	4.1	5.1
14	Automobiles	90,987	53,004	—41.7	1,396,882	1,514,660	6.5	3.5
20	Auto accessories	21,413	11,643	—45.6	245,895	299,040	8.7	3.9
4	Building materials	3,331	2,202	—33.9	95,959	106,640	3.5	2.1
12	Chemicals	41,708	33,210	—20.4	789,126	920,009	5.3	3.6
5	Coal mining	1,420	595	—58.1	91,836	90,435	1.5	0.7
6	Electrical equipment	22,166	21,097	— 4.8	613,151	699,876	3.6	3.0
5	Household supplies	1,306	1,623	+24.3	111,249	113,738	1.2	1.4
18	Iron and steel	69,979	58,615	—16.2	2,752,607	3,132,980	2.5	1.9
12	Machinery	7,380	7,259	— 1.6	156,413	181,076	4.7	4.0
2	Merchandising	3,331	2,861	—14.1	86,331	92,525	3.9	3.1
6	Mining, non-ferrous	3,320	2,278	—31.4	90,758	105,325	3.6	2.2
4	Office equipment	5,467	4,142	—24.2	110,662	116,147	4.9	3.6
5	Paper products	1,164	1,583	+36.0	56,567	60.358	2.1	2.6
16	Petroleum	22,729	21,712	— 4.5	1,130,356	1,212,956	2.0	1.8
5	Railway equipment	3,522	4,791	+36.0	124,373	140,599	2.8	3.4
3	Realty	2,709	2,367	—12.6	79,423	79,127	3.4	3.0
21	Miscellaneous	11,710	10,724	— 8.4	268,485	276,039	4.4	3.9

Just Among Ourselves

Industry's Personnel in Changed Locations

PERSONNEL changes continue to grow in volume throughout the industry. Probably that's natural at a time like this, when earnings statements are showing up unfavorably and everybody's under scrutiny as well as pressure.

Doubtless there will be some more of these shake-ups before finis is written to the automotive year of 1930. When the smoke has all cleared away, a few familiar faces may be missing, but it's our guess that most of them will still be smiling and working—behind different desks perhaps but still in there plugging away manfully as part of the greatest manufacturing industry the world ever has developed.

* * *

Enjoyment in Motoring Follows the Byways

EACH year about this time we are constrained to write another blast about how greater encouragement to people to use secondary roads for pleasure driving would relieve congestion on the main highways and foster the sale of more automobiles.

This year the editor of the British journal *Motor* has done the job for us. In his April issue, he writes in part:

"With the commencement of the second quarter of the year we have reached the period when at fine week-ends the maximum number of cars will be on the roads. We may be sure of one thing and it is that a majority of motorists will make their way . . . by the main road, as usual.

"It is difficult to account for this slavish and determined adherence to the main road. Today there are very few bad roads anywhere. . . . What is wanted today is a greater spreading out of vehicles over a greater area of highway so as to relieve the uncomfortable and often dangerous congestion on the main roads. . . . Those who are now finding their ways by these secondary routes are really getting the most enjoyment out of motoring—and it seems likely that they will have the good fortune to continue to do so, for the main road mania seems to be as ingrained as ever."

* * *

Button, Button, Who Has the Replacement Parts Business?

"BUTTON, Button—Who's got the replacement parts business"—and who's going to get it in the future? Car and truck manufacturers certainly are taking a more active part in this perennial game than they have for a long time past. Plenty of new angles are developing on an old diagram.

And everybody has his own point of view—the car manufacturer, the parts maker who supplies him with original equipment and sells for replacement as well, and the independent parts producer whose efforts are concentrated entirely in the replacement field. Naturally some of these views are conflicting; that's inevitable with a question of such monetary importance and of such complex and conditional ramifications.

Final decision in the debate probably will be made by Old John Public, although that worthy old codger doesn't even know that there's a debate of importance going on and probably never will.

In the meantime we've made bold to put down on paper a multitude of thoughts growing out of 10 years' contact and several recent weeks of almost complete immersion in the subject. So as not to discourage possible readers too much, we have broken these lucubrations down into four separate articles, the first of which is scheduled to appear in *Automotive Industries* next week.

It's been a long while since we've tried our hand at so volatile as well as so controversial a theme. We've tried to be fair as well as frank. How well we have succeeded we'll know when the brickbats begin to arrive.

* * *

Replacement Profits Reduce Original Equipment Costs

ONE point which we haven't labored in this coming series may, perhaps, be mentioned here. The prices which car and truck manufacturers pay for several items of original equipment inevitably would have to be higher were their parts suppliers not making excellent profits from their replacement business.

This isn't true any more, of course, as regards a majority of original equipment items. Parts makers in most instances today are making a fair profit on their original equipment business. True, they have had to cut production costs, reduce overhead and generally produce economically to achieve this end in the face of decreasing rather than increasing prices. But it has been achieved in a majority of instances, as 1929 profit statements from important original equipment suppliers indicate.

—N. G. S.

Brownback Tiger Aircraft Engine Has Two-Throw Crankshaft

Unit develops 90 hp. at 1700 r.p.m. Weight just under 3 lb. per rated hp. Six cylinders in offset arrangement.

THE Light Manufacturing & Foundry Company of Pottstown, Pa., is now in production on an aircraft engine of the air-cooled radial type, known as the Brownback Tiger C-400. Approved Type Certificate No. 33 has been issued for it by the Department of Commerce, the engine having an approved rating of 90 hp. at 1700 r.p.m. It has six cylinders which are arranged in two circles slightly offset in the direction of the crankshaft axis, the six pistons acting on two crank throws making an angle of 180 deg. with each other. The engine sells at $1,495.

Each cylinder has a bore of 4.13 in. and a stroke of 5 in., giving a piston displacement of 397 cu. in. The compression ratio is 4.8 to 1. The total weight of the engine, dry, and without propeller hub and starter, is 268 lb., which is just shy of 3 lb. per rated horsepower.

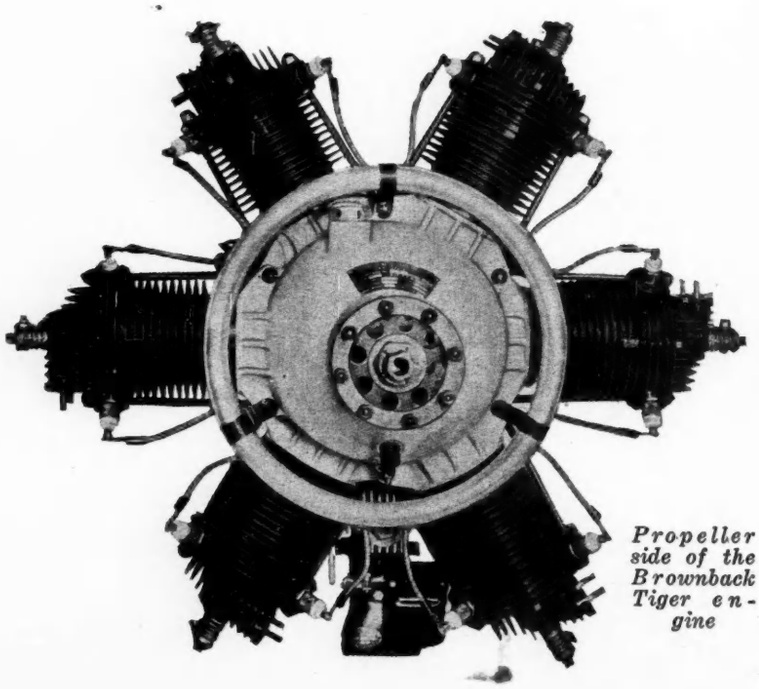
The Tiger engine differs from other designs of the same general type and power output mainly in having two circles of cylinders and a double-throw crankshaft. This type of construction was chosen evidently because of the better balance which it makes possible. With a single circle of cylinders it is customary to use one master connecting rod and a number of articulated rods. Part of the inertia forces due to the reciprocating weights can then be neutralized by counter weights on the crank arms, but a considerable part must remain unbalanced. The so-called secondary forces remain completely unbalanced. In an engine with a two-throw crankshaft the secondary forces on the reciprocating parts in one plane are neutralized by those on the reciprocating parts in the other plane, except for the slight couple produced due to the distance apart of the two planes. In the Brownback Tiger this is reduced to a minimum by undercutting the long crank arm between the two crankpins, thus reducing the distance apart of the center planes of the two sets of reciprocating parts.

The cylinders are cast of nickel chromium iron, and the lower end of each cylinder barrel extends into the crankcase, acting as a pilot for locating it and as an oil shield. The cylinder heads are heat-treated aluminum-alloy castings with integral cooling fins. These cylinder heads are held in place by means of two alloy steel "through" bolts extending down to the crankcase. In addition they are secured to the cylinder barrels by means of three alloy steel studs, the latter serving primarily to insure gas tightness of the joint between cylinder barrel and head, which is provided with a copper-asbestos gasket.

There are two ports in each cylinder head, the axes of which make a right angle with each other. To the port facing aft the inlet pipe is attached, while the exhaust horn is secured to the lateral port. Bosses within the ports carry the bronze valve guides which are pressed in place. The valve seats are of aluminum bronze and are shrunk into the cylinder head.

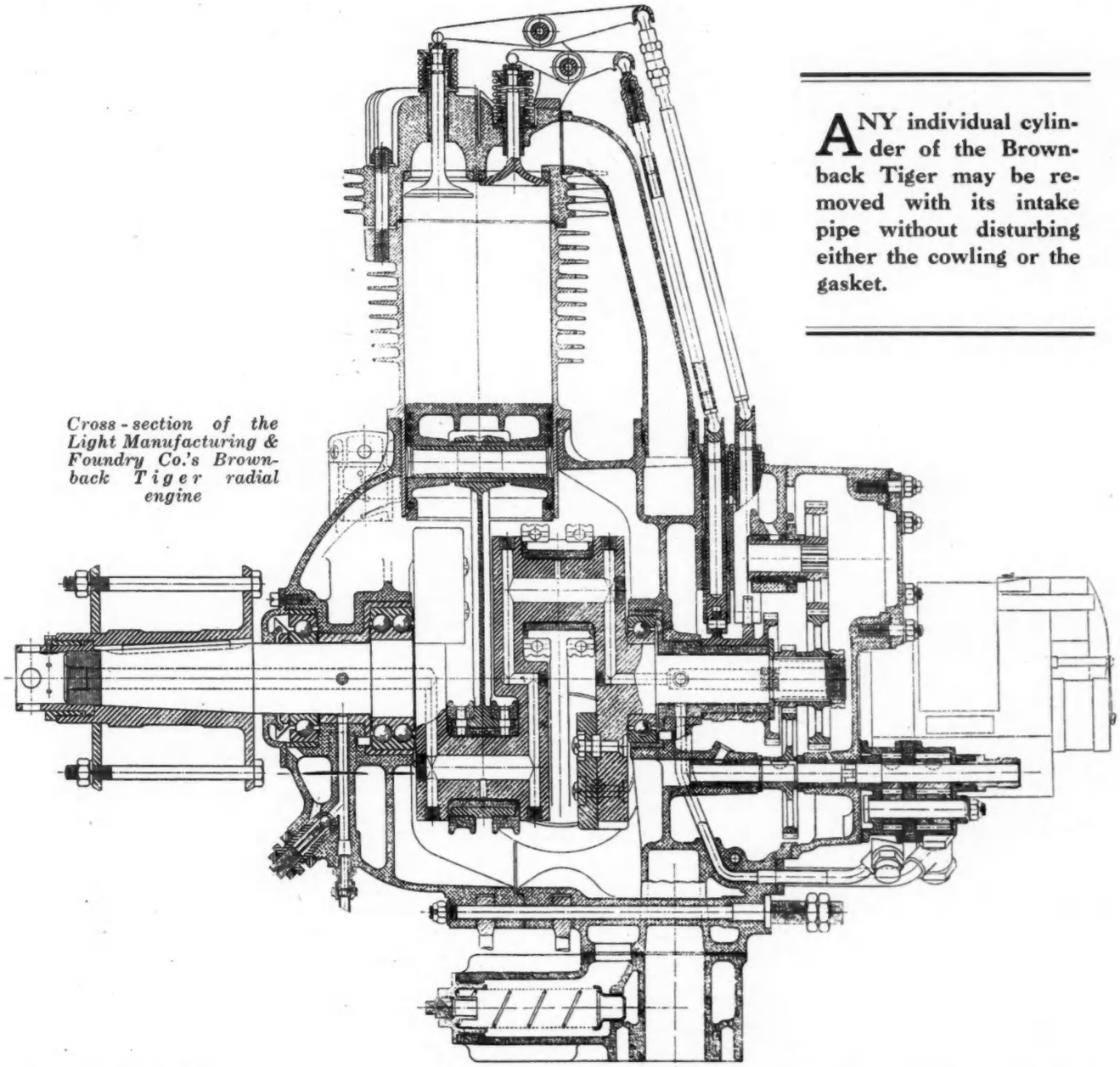
Any cylinder and its intake pipe can be withdrawn from the engine after merely removing the nuts from the two hold-down bolts, and without disturbing any cowling. The inlet pipes are a sliding fit in the inlet manifold ring in the crankcase, the joint being sealed with a rubber ring. When the cylinder is removed the inlet pipe comes off with it, and no gasket joint is broken.

All six valves of the same kind are operated by a single cam of the tangential type, which turns at one-half crankshaft speed and is mounted on an extension of the rear main bearing. Valve motion is transmitted from the cam through roller-type cam followers, adjustable tubular push-rods having alloy steel ball ends, and alloy-steel rocker arms.



Propeller side of the Brownback Tiger engine

ANY individual cylinder of the Brownback Tiger may be removed with its intake pipe without disturbing either the cowling or the gasket.



Cross-section of the Light Manufacturing & Foundry Co.'s Brownback Tiger radial engine

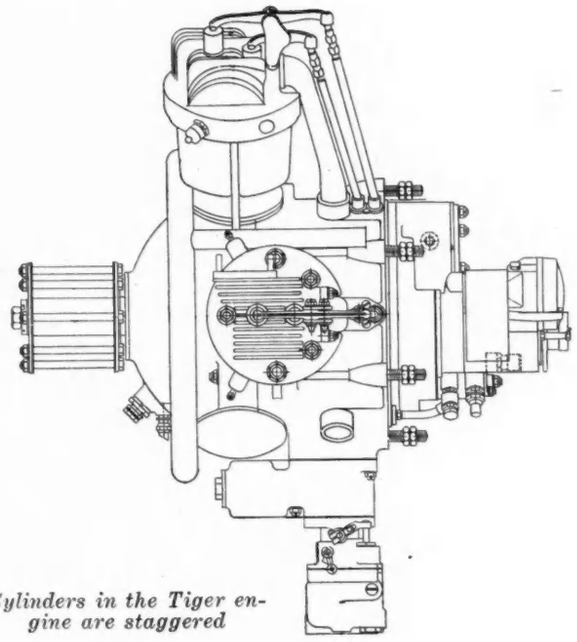
The ball end, which carries the pushrod ball, and the cylindrical end operating the valve are case-hardened. The two rocker arms are located one above the other in a plane through the crankshaft axis, in order to reduce the head resistance to a minimum. These rocker arms are drop forged of alloy steel, case hardened, and they operate on hardened alloy steel pins, the bearings being provided with grease lubrication. Both rocker arms are carried on a single forged alloy steel pedestal fastened to the cylinder head by two bolts and nuts, the latter being wire-locked. The valves are of the tulip type, with 30 deg. seat angles, and are made of Silcrome steel. The end of the valve stem is provided with a hardened steel cap which takes the wear due to the rocker arm. Conical alloy steel locks are used, and each valve has two concentric springs of vanadium steel.

The crankcase consists of three aluminum alloy castings suitably heat-treated. The two forward sections form the crankcase proper and have a telescoped joint in a vertical plane. The front portion is hemispherical in shape, this shape giving maximum strength for a given weight and permitting of cowling to keep down the head resistance. It carries the front main and thrust bearing as well as the bearing for the radial load due to the propeller. An oil turbine designed to prevent loss of oil through the front of the case is mounted in front of this bearing. This section of the crankcase carries the breather, and also has the oil relief valve located in it.

The middle section carries the main rear bearing, the valve tappet guides and the mounting pilot. The inlet manifold is cast integral with this section. The two sections thus far described are held together by means of nickel steel "through" bolts, which also serve to secure the engine to the mounting plate.

The rear section of the crankcase acts as a gearcase cover and as a base for mounting the oil pump, the starter and the magnetos. All gears are carried at the rear end of the engine, and are made accessible by removing the rear section of the case (or gearcase cover).

The crankshaft, which, as already described, is of the double-throw type, is made from a drop forging of



Cylinders in the Tiger engine are staggered

chrome-nickel steel made in the electric furnace. It is completely machined and provided with counter weights on its two short arms, these being so calculated that they will balance the assembly of connecting rods, their bearings, the upper ends of the connecting rods, and the pistons. The main bearings are a combination of ball and plain bearings, end thrust being taken on the double-row, deep-groove ball bearing adjacent to the forward short arm of the crankshaft.

The crankshaft is drilled out to provide passages for pressure lubrication of the connecting rod bearings. Oil is fed into the shaft through the rear main bearing and leaves it through the front main bearing. Radial holes are drilled in the crank pins.

Aluminum Alloy Pistons

Aluminum alloy pistons with internal ribs are used, these being cast in semi-permanent molds. Each piston is fitted with four rings, of which the lower two serve for oil distribution and oil control. The piston pins are made of low carbon chrome-nickel steel, the thickness of the tubular section being comparatively large at the center and decreasing toward the ends. In accordance with the usual practice, the pins are case hardened, ground and lapped. They float in the bronze-bushed upper ends of the connecting rods and in the piston bosses, and are prevented from drifting by steel snap ring set in grooves in the piston bosses.

The connecting rods are of the slipper type, the slippers bearing on the bronze back of the crankpin bearings. The heads of the rods are held in place by two collar bearings forged of aluminum bronze, which bear on the outside of the slippers and are held together by alloy steel bolts. The joints of the collars are tongued and grooved. The connecting rods are I-section alloy steel forgings, and are machined all over. One rod is anchored to the connecting rod collars and the crankpin bearing, thus forming a master rod assembly. The axes of all connecting rods pass through the center of the crankpin. The slipper at the big end of the connecting rod subtends an angle of about 88 deg. at the axis of the crankpin, but the edges of the slippers make an angle with the crankpin axis, which is said to make the effective length in the direction of the bearing circumference much greater, thereby preventing canting. The angular motion of the rods in the collars and on the bearing is very slight, and since the whole assembly is lubricated with oil under pressure, the life of the bearing and collars is said to very long. Moreover, when these parts are worn they can be replaced with new ones without machining or fitting.

The cam gear is made of alloy steel and case-hardened, and it is supplied with oil under pressure. It is driven from the crankshaft timing pinion through an idler gear and an intermediate gear, which latter also drives the oil pump. The cam gear floats on an extension of the rear main bearing. It runs at half crankshaft speed and carries two separate cams, one for the intake valves and one for the exhaust.

The starter gear is forged of chrome-nickel steel, hardened, and meshes directly with the magneto drive gear on the crankshaft. This starter gear is splined for use with any 5-in. starter of American make. The oil pump is mounted on the gearcase below the two magnetos. The lubricating system being of the dry sump type, a double pump of the gear type is used.

Oil-Cooling Fins

The oil sump is an aluminum casting which is fastened to the bottom of the crankcase. It contains a filter chamber within which there is a fine-mesh oil screen. Cooling fins on the outside of the sump serve to cool the oil before it is returned to the crank. The carburetor is also bolted to this unit. This results in the incoming charge being slightly heated by the warm oil. On the way to the combustion chambers the charge passes through a manifold cast in the crankcase, whereby its temperature is maintained. The inlet pipes are of oval section with the flat side turned toward the rear side of the cylinders, so that considerable heat is absorbed from the cylinders.

Two Robert Bosch magnetos are fitted, on adjustable flange mounts, which permits of rapid synchronization. The magnetos run at 1½ times engine speed. These two magnetos, mounted on the gearcase cover, are driven directly by the magneto drive gear and hardened alloy steel gears secured to the armature shafts of the magnetos.

Hug Six-Wheel Truck

ADDITION of a new 10-ton, two-wheel drive, six-wheel model to the Hug line has been announced by the company. The new truck, known as Model 98, is designed to carry a chassis pay-load of 10 tons and draw a trailer of equal capacity, making a combined total load for chassis and trailer of 20 tons. It is equipped with a six-cylinder Buda engine, seven-speed forward and two-speed reverse Brown-Lipe transmission, Wisconsin double reduction rear axle, auxiliary dead axle and Westinghouse air brakes on four rear wheels.

The Buda GF-6 L-head engine has 4¾-in. bore and 6-in. stroke developing 126 hp. at 1850 r.p.m. Lubricant is forced by a camshaft driven gear pump through seamless tubing cast in the crankcase to all crankshaft, camshaft and connecting rod bearings. The crankshaft is carried in four bearings, and the crankcase is divided horizontally 4-in. below crankshaft center. The engine is fitted with an oil filter and a built-in governor. Ignition is furnished by a Robert Bosch high-tension dual magneto with impulse coupling.

Weight-Saving Factor of Aluminum Demonstrated in Tank Truck Tests

National Refining Company conducts series of hill climbing trials for trailers, as well as drop, hydrostatic and fire experiments with units made of steel and the lighter alloy.

THE National Refining Company recently conducted a test in Cleveland for the purpose of obtaining a comparison between steel and aluminum tank trailers of similar design and capacity. The primary function of the test was to determine whether or not a truck could haul an aluminum tank trailer up a hill in less time than was required to haul one built of steel. Both trailers were loaded with 750 gal. of gasoline and two 55-gal. drums of lubricating oil. The aluminum trailer was 1875 lb. lighter than the steel trailer. This is the equivalent of 300 gal. of gasoline weighing 6.25 lb. per gallon. A number of truck manufacturers participated in the test, and hauled both trailers up two hills, one having a dirt road and the other a brick road. The steepest grade was approximately 13 per cent.

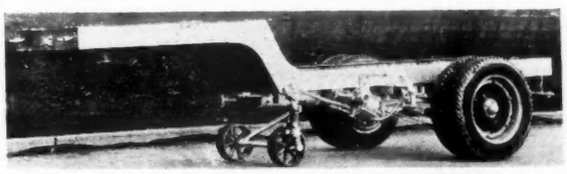
Results of the test were given in tabular form. The dirt road hill was divided into seven sections, each with an average gradient which was determined, while the brick-paved hill was divided into 25 sections, also with different known average gradients. The time taken from the beginning of each test route to the end of each section was recorded, together with the gradient of the last section passed over, and the gear used during that section. Separate runs were made, of course, with each truck hauling each of the two trailers, aluminum and steel. In the accompanying table are given only the times for the complete test route, which was 965 ft. long in the case of the dirt-road hill, and 3700 ft. in the case of the brick-paved hill.

It must be borne in mind that the test was not of the trucks themselves. The gear ratio on the several trucks differed materially. This undoubtedly accounts for the difference in total time. The results are significant, however, in showing that less time is required when the truck is operated in conjunction with the aluminum tank trailer.

The two tank trailers are of four compartments. The tanks were built by the Davis Welding & Manufacturing Company, and were mounted on Fruehauf drop frame semi-trailers. Before undertaking the construction of a tank trailer in aluminum, the Davis Welding & Manufacturing Company ran a series of drop, hydrostatic and fire tests on aluminum tanks fabricated from different gage sheet, to determine the best gage material for the construction of production tanks, and to demonstrate that aluminum compares favorably with the blue annealed steel ordinarily used in gas tank construction.

Heavy-gage, 150-gal. tank after 25-ft. drop. No fracture occurred

All-aluminum, 750-gal., four-compartment Davisbilt clipper tank, mounted on an aluminum drop-frame Fruehauf semi-trailer



The drop-frame Fruehauf semi-trailer which was fabricated from strong aluminum alloys

The aluminum tank is of similar construction to the standard Davisbilt steel tank, except that the joints are butt-welded instead of being lap-welded. Aluminum is used in the bulk heads, wrapper sheets, castings, finished bands, bolsters, bucket box, can rack and other sheet panels, and in the piping and fittings with the exception of the valves. Oak is employed in the running boards, bucket box floors and the floors for the can racks. If on subsequent tanks it is found practical to replace the oak with aluminum, an additional saving in weight of approximately 200 lb. can be effected.

TANK TRAILER WEIGHT TESTS

Results on Winding Brick-Paved Hill

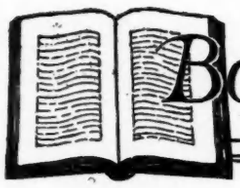
Make of Truck	Aluminum Trailer	Steel Trailer
Autocar	3 m. 6 s.	3 m. 23 s.
Chevrolet	3 m. 27 s.	3 m. 3 s.
Diamond T	5 m. 30 s.	5 m. 57 s.
Dodge	8 m. 39 s.	6 m. 50 s.
Ford	6 m. 47 s.	6 m.
GMC	3 m. 36 s.	3 m. 53 s.
Indiana	3 m. 52 s.	
Mack	4 m. 19 s.	4 m. 41 s.
Reo	3 m. 16 s.	3 m. 43 s.
White	4 m. 30 s.	3 m. 52 s.

Results on Dirt-Road Hill

Make of Truck	Aluminum Trailer	Steel Trailer
Autocar	59 s.	1 m. 15 s.
Chevrolet	1 m. 13 s.	1 m. 20 s.
Diamond T	1 m. 42 s.	1 m. 50 s.
Dodge	2 m. 8 s.	2 m. 32 s.
Ford	2 m. 1 s.	2 m. 9 s.
GMC	1 m. 5 s.	1 m. 15 s.
Indiana	1 m. 14 s.	1 m. 18 s.
Mack	1 m. 22 s.	1 m. 28 s.
Reo	1 m. 2 s.	1 m. 13 s.
White	1 m. 8 s.	1 m. 15 s.

The Fruehauf drop-frame trailer on which the aluminum tanks are mounted is of riveted construction, and is fabricated almost exclusively from the strong aluminum alloys. These alloys in the wrought state are comparable in strength to steel, but at saving in weight of approximately 50 per cent. The upper fifth wheel, the supports, support wheel, castings, frame and wheels are all of aluminum. The total load of the trailer is distributed in such a manner that only 1300 lb. is on the rear axle, and 300 lb on the king pin. The tires are 30 x 5 dual pneumatic and the wheelbase 110 in.

Oil refiners have shown considerable interest in the question of the practicability of using aluminum tanks for the distribution of their products, and we understand that more than 200 representatives of over 36 different companies witnessed the tests made by the National Refining Company in Cleveland. Considerations of economical transportation point to the use of large capacity transportation units, but a limit is set on this development by the weight limits on highway vehicles set by the different state laws. A gain can be made, however, by reducing the dead load. Any weight thus saved can be replaced by pay load, and that without adding to the chief items of operating cost, namely, driver's wages, fuel and tires.



Books for the Business Bookshelf

A Vapor-Pressure Chart for Hydrocarbons

By Hal B. Coats and George Granger Brown, Circular Series No. 2 of the Department of Engineering Research, University of Michigan, Ann Arbor, Mich.

THE circular or bulletin referred to is accompanied by a logarithmic chart of vapor-pressures of the paraffin hydrocarbons generally found in natural gas gasoline. One of the authors, Hal B. Coats, is holder of the fellowship of the Natural Gasoline Association, while Mr. Brown is director of research for the Natural Gasoline Association. In the chart the vapor pressure for any given hydrocarbon in its relation to the temperature is represented by a straight vertical line. With few exceptions the chart reproduces the experimental data to within one-half of one degree Centrigrade, and these deviations are believed to be due more to errors in the experimental data than to inherent inaccuracies of the chart.

Smithsonian Institution Annual Report for 1928

Government Printing Office, Washington, D. C. 763 pp.

THE report of the institution for 1928 covers chiefly the pure sciences, with reprints of outstanding papers contributed during the year. In the report of the secretary, for the United States National Museum, the following appears:

"The single object of the greatest popular interest that has come to the museum in many years is Colonel Lindbergh's airplane, the Spirit of St. Louis, deposited with the Smithsonian Institution, which has drawn large crowds since the day of its installation. There may be mentioned also the Pan American good-will flyer San Francisco, transferred from the War Department, with the Army Curtiss racer airplane which won the Pulitzer and Schneider races of 1925. A Curtiss pusher type airplane of the period 1909 to 1914 is also an important addition. For the land transportation section there was secured a White-Stanhope steam automobile of 1901-1902" (p. 37).

Commercial Chromium Plating

By Richard Schneidewind. Department of Engineering Research, University of Michigan.

THIS is a further contribution to the literature of chromium plating from Mr. Schneidewind, who has previously published "A Study of the Patents Dealing With the Electrodeposition of Chromium" and "A Study of Chromium Plating."

Good chromium plating practice depends on the plater's ability to maintain correct and identical conditions in respect to the following four essentials: 1. Temperature of the solution in contact with the work; 2. Current density on the surface of the work; 3. Condition of the surface of the work; 4. Composition of the plating bath. Since some of the necessary plating conditions are quite dependent on well-designed equipment, the general principles for the design of such equipment are given in this circular,

although equipment is dealt with only in a general way. The effect of variations in plating conditions, such as temperature, current density and composition of solution, is also presented, this information being believed to be of value to the practical plater. The research work on which the pamphlet is based was carried out with the financial assistance of the Detroit Edison Co.

N. A. C. A. Report No. 330

By A. G. Gelalles and A. M. Rothrock

EXPERIMENTAL and Analytical Determination of the Motion of Hydraulically Operated Valve Stems in Oil Engine Injection Systems" is the report of research on the pressure variations in the injection system of the N.A.C.A., spray photography equipment and on the effects of these variations on the motion of the timing valve stem. It was undertaken in connection with the study of fuel injection systems for high-speed oil engines. The spray photography equipment employed for these tests consists of a fuel injection system for producing an oil spray, an electrical spark system for illuminating the spray, and a photographic camera for recording its development.

The timing valve stem was held against its seat by a helical spring so adjusted that the total hydraulic force on the stem actuated it immediately after it had been mechanically lifted from its seat. The lift of the stem was recorded photographically to determine the effects of injection tubes seven in. and 43 in. long. The pressure variations at the seat and in the injection valve tubes were analyzed and the lifts of the stem for both tubes computed from the analysis and compared with the experimental records.

The methods of analysis of the pressure variations and the general equation for the motion of the spring-loaded stem for the timing valve are applicable to a spring-loaded automatic injection valve, and in general to all hydraulically operated valves. A sample calculation for a spring-loaded automatic injection valve is included.

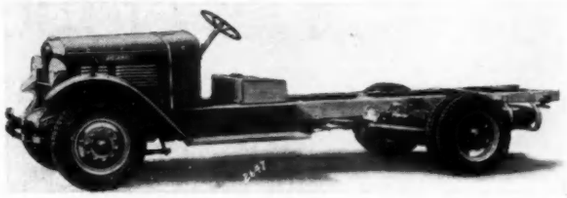
Report No. 330 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

Brockway Adds Four Models

FOUR new large truck models, all with double-reduction rear axle drives, have been announced by Brockway-Indiana. These have gross weight ratings of 14,000, 17,000, 19,500 and 22,000 lb., corresponding to net load capacities of approximately 3½ to 5 tons. Chassis weights are 5500, 6800, 7500 and 8200 lb. respectively. The smallest truck has a standard wheelbase of 156 in., while that of each of the other three models is 170 in., but special wheelbases are available with each of the four models. All of these trucks are designed for pneumatic tire equipment, tire sizes ranging from 32 by 6 in. to 36 by 8 in., duals being fitted in the rear in each case.

All four models are fitted with Continental engines, the engine displacements of the four models being 311, 381, 381 and 427 cu. in. respectively. An electric generator and a starter of Auto-Lite make are included in the standard equipment, and ignition is by the battery system. Pressure lubrication is employed and the carburetor is provided with an Air-Maze air cleaner. Brown-Lipe multiple-disk clutches and four-speed transmissions are combined with the engines into unit powerplants. The smallest model has a Columbia front axle, while the same unit on the other three models is of Shuler make. All rear axles are Wisconsin.

Frames are of heat-treated pressed steel, the channel sections of the side rails having the following



Model 195, one of the new Brockway-Indiana truck chassis

dimensions: 7½ x 3 x ¼, 8 x 3 x ¼, 8⅛ x 3 x 5/16 and 8⅛ x 3 x 5/16. Front springs on all four models are of the same dimensions, viz., 40 by 2½ in.; similarly the rear springs are of the same dimension throughout the line, 54 by 3 in., but the number of leaves in the springs is increased with the capacity of the truck. Front springs have 9, 10, 11 and 11 leaves respectively; rear springs, 15, 17, 18 and 19. Helper springs are provided on each chassis. All models have cam-and-lever steering gears and four-wheel hydraulic brakes with booster actuation.

Standard equipment consists of heat indicator, crowned front fenders, running boards with splash shields, bar spring bumper, jack, set of tools, electric lighting and starting equipment, electric horn, oil gage, ammeter, dash light, air cleaner, oil filtrator, speedometer, rear vision mirror, grease gun, tire carrier and one extra wheel.

Andalusite in Making Spark Plugs

ANDALUSITE, a little-known mineral which plays an important part in the making of spark plugs, comes mainly from the high altitudes of the Inyo Mountains of California, according to the United States Bureau of Mines, Department of Commerce.

The minerals andalusite, kyanite and sillimanite differ in physical properties but have the same chemical composition. Although all three of these silicates of alumina are employed in industry, they are often referred to indiscriminately as "sillimanite." Another mineral that is closely related to this group is dumortierite.

Prehistoric implements made of compact sillimanite are found in western Europe and have a certain resemblance to jade implements, but the mineral was named in honor of Benjamin Silliman, the elder, who was born in 1779, states Alice V. Petar, in a report just published by the bureau.

The commercial utilization of this group of aluminum silicate minerals is a recent development. It had its beginnings during the World War in the search for a suitable insulating material for spark plugs.

In the course of tests at the Bureau of Standards some years ago on spark-plug porcelains it was determined that in a good spark-plug poreclain the quartz should be eliminated from the composition and replaced by some other substance. Natural sillimanite, found in the Inyo Mountains in California, was developed for this purpose.

Centralized Lubricating System Developed by Farfall

Metering type unit operates under pressure up to 2000 lb. Four models produced, with one especially adapted for motor vehicles

A CENTRALIZED high-pressure lubricaing system, designed for all types of machinery, and also applicable to automotive vehicles, has been developed and placed on the market recently by the Farfall Co. of Detroit. Produced in four sizes, with three types of pumps, the "Dependable" lubricating system is of the metering type, with individual metering nozzles for each bearing. It operates under a pressure of up to 2000 lb. p. sq. in., which should assure lubrication of all bearings from the centralized unit.

It is stated by the manufacturers that the system will handle any lubricant that will "flow." Of the four sizes produced, Models 400 and 300 are large hand-operated units for all heavy machinery. Model 1100 is designed for lighter machinery, and Model 1000 is specially adapted for use on motor vehicles.

Fig. 1 shows the Model 400 pump assembly. The action of the plunger *E*, when withdrawn, causes the piston valve *A* to move toward the plunger until it strikes the bushing *B*, opening the passage *C* to the pump cylinder *D*, plunger suction drawing lubricant from the supply chamber through this passage. When the plunger *E* is brought forward, the piston valve closes and diverts the lubricant to the main feed line through the compensating valve *F*. Most of the parts shown in this illustration are also interchangeable with Model 300, which is designed to handle from 25 to 30 nipples, as against 30 to 40 for Model 400.

Fig. 2 shows a section of the Model 1000, designed for motor vehicle centralized lubrication. It mounts on the back of the dash, with a foot plunger horizontally projecting through it. It will be noted that the principle of operation is identical with that of the larger unit, the main difference being in the provision of a spring for returning the plunger pedal. The main wearing parts are double leather washers on the plunger piston.

The compensating valve incorporated on all models is shown in section as part of Fig. 1. It is designed to hold the feed line full of lubricant while the plunger is being retracted. The measuring nipple used in the Farfall systems is shown in Fig. 3. Under pressure piston 3 moves forward, ejecting the lubricant contained in the supply chamber 6. As the pressure in the line is relieved, following the stopping of the pump plunger, the spring returns the piston gradually to its former position, trapping a definitely measured amount of lubricant in the measuring chamber recess

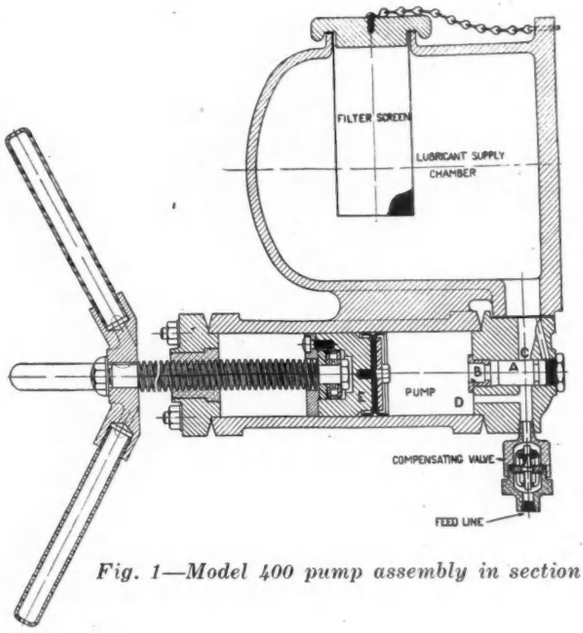


Fig. 1—Model 400 pump assembly in section

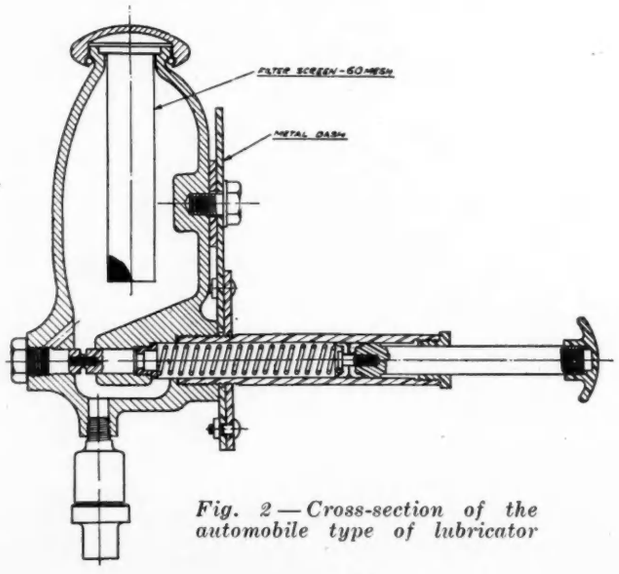


Fig. 2—Cross-section of the automobile type of lubricator

4. The ball check valve prevents the return of lubricant from the bearing into the nipple. As the piston returns, a partial vacuum is created in chamber 6, this assisting gravity in drawing the supply of lubricant into the discharge chamber, ready for the next ejection.

It will be noted therefore that the nipples are positive in their action and can be discharged only once during a pump stroke. For this reason the pressure gage supplied with the system and located near the pump on industrial installations serves as an indication that all nipples have been discharged if the pressure indicated shows that pressure has been built up in excess of the amount necessary to discharge the nipple farthest away, a pressure which can readily be determined by trial. There are four sizes of nipples in use at the present time, ranging from 5/16 to 13/16 in., all being brass forgings with metal-to-metal contact where the tubing enters the nipple. The smallest size is for use with the Model 1000, on motor vehicles.

Further features of the Farfall "Dependable" system include a Timken bearing on the plunger shaft to take the thrust, filter screens in the supply housing to prevent foreign matter from entering the system (felt filters for use in foundry installations), and the ability to flush bearings with kerosene through the design of the system to handle all fluids. Fittings are mainly of the standard S.A.E. type, special fittings including a swivel joint for use on moving or revolving parts requiring lubrication. The latter is designed to be self-lubricating.

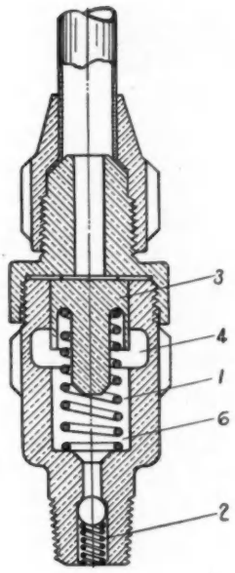
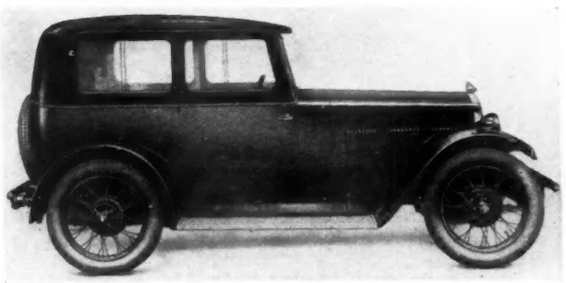


Fig. 3—Farfall measuring nipple for Dependable lubricating installation

Wolseley 12 H. P. "Hornet"

SIR WILLIAM MORRIS, from his Wolseley plant at Birmingham, has introduced the smallest and cheapest six-cylinder car yet produced by a British manufacturer. The fabric sedan is priced at £175.



The Wolseley "Hornet" sedan

Known as the Wolseley "Hornet," it resembles in many respects the four-cylinder Morris Minor.

The engine has the same bore and stroke as the Morris Minor, viz., 2.24 by 3.27 in. (piston displacement, 77.5 cu. in.). Like the Minor, too, it has an overhead camshaft driven by spiral bevel gears; the crankshaft has four bearings; lubrication is by pressure throughout; an S.U. carburetor is fitted with gravity feed; water circulation is by thermo-syphon assisted by an impeller on the fanshaft. The radiator has thermostatically operated shutters and a thermometer on the filler cap; engine and three-speed gearbox are built as a unit with a single-plate clutch; transmission is by an open tubular propeller shaft with fabric disk joints; semi-elliptic springs are used with hydraulic shock absorbers.

The rear axle is of the three-quarfer floating type with spiral bevel drive, the hubs being mounted on ball bearings. The front axle is a steel stamping. Lockheed hydraulic brakes are fitted, the hand lever applying directly to the rear-wheel shoes. Wire wheels are standard, 19 in. for 4-in. Dunlop tires, the spare wheel being carried on a bracket at the rear of the body. The track is 42 in., the same as the Morris Minor, the wheelbase being 12½ in. longer, viz., 90½ in.

Sterling Heavy Duty Models

TWO new heavy-duty four-wheel drive, six-wheel trucks equipped with large six-cylinder engines, 12-speed transmission combinations, Timken tandem rear axles and Westinghouse air brakes on all six wheels are offered by the Sterling Motor Truck Co. Except for the size of the engines and axles, both models are identical.

Model EWS-40, rated at 12-ton capacity and having a road speed of from 24 to 30 m.p.h., is powered by a 5 x 5¾-in. Sterling Model RB six-cylinder engine developing 126 hp. at 1800 r.p.m., while Model EWS-36, rated at 10 tons and capable of 26 to 33 m.p.h., is equipped with a 4½ x 5¾-in. six-cylinder Model AB Sterling engine developing 98 hp. at 1850 r.p.m.

Both engines have Ricardo combustion chambers. Crankshafts are 3½ in. in diameter and rotate in four main bearings. Lubrication is full pressure and governors are built in the engines. Magneto ignition is standard but when electric lights and batteries are used, distributor ignition is employed instead. Stewart vacuum-fed Zenith carburetors and tubular radiators are common to both models.

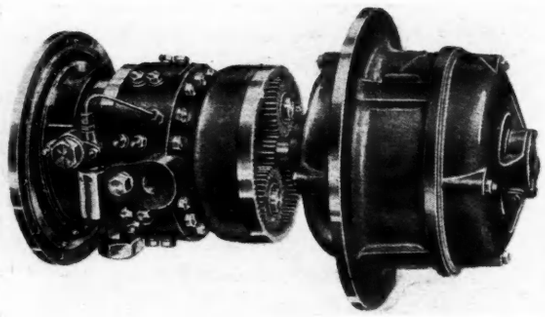
Mounted in unit with the engine is a Brown-Lipe multiple-disk clutch and four-speed transmission. The transmission, however, is supplemented by a patented three-speed Sterling auxiliary transmission which, together with regular transmission, furnishes a range of 12 different speeds. Spicer universals connect the transmissions and Blood Brothers equipment is employed to connect with the axles.

NEW DEVELOPMENTS—AUTOMOTIVE

High Pressure Hydraulic Pump

AN adjustable range of pressure from 300 to 4200 lb. per sq. in. is available on the new Bussman hydraulic pump, series BM, recently introduced for installation on various types of presses by the Index Machinery Corp., Cincinnati, Ohio, American agents for Hahn & Kolb, Stuttgart, Germany.

These pumps may be installed in the oil container or in the machine base, depending upon available space. The main features are: a low pressure stage, for quick approach and return of ram, a high pressure stage with a small delivery of oil for the feed; automatic change from low to high pressure by means of an auxiliary valve. Lubrication of the unit is effected by the pressure oil.



Bussman high pressure hydraulic pump

Cincinnati Plain and Universal Millers

TWO new milling machines known as the No. 4 Plain and Universal have been added by the Cincinnati Milling Machine Co., Cincinnati, Ohio. They have the same general characteristics as the No. 3 Millers announced at the Cleveland Machine Tool Show in 1929.

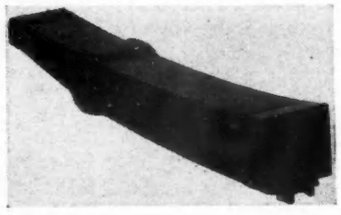
Sixteen spindle speeds ranging from 14 to 450 r.p.m. and sixteen table feeds ranging from ¾ to 30 in. are changed by an automatic power shift mechanism controlled from either the front or rear. To change speeds the lever located at the front of the tree is shifted to the left with the starting lever in stopped position until the desired speed on the upper revolving colored dial appears opposite the arrow. Engaging the starting lever gives the new speed. Changing feeds requires only the shifting of this same lever to the right until the desired feed of the lower revolving dial appears opposite the arrow. Independent directional control levers are provided for cross, vertical and longitudinal movements of the table. Each one of the movements also has power rapid traverse with the spindle stopped or running. Rates are: longitudinal 100 in., cross 50 in. and vertical 50 in.

Kipp Air Grinder for Metal Work

THE Madison-Kipp Corp., Madison, Wis., announce the Kipp air grinder, for die makers, metal pattern makers and similar skilled artisans. This instrument is held in the hand and used somewhat in the way that a man uses a fountain pen, the overall length being 8¼ in. and the barrel diameter slightly under an inch. The weight is 12 oz. Compressed air, supplied by means of a special porting arrangement, provides a spindle speed of 40,000, which produces rapid grinding action even with a ½-in. wheel. The complete grinder includes hose, air connections and four grinding wheels.

Molded Rubber Spring Shoes

THE molded rubber shoe for half-elliptic springs illustrated herewith has been introduced in England by the Jointless Gaiter Co., Clarendon Street, Coventry. By means of end-clips and interior thickening at the small end of the spring it can be rendered grease-tight and waterproof, so the makers claim, that it can be charged with a grease gun, with either grease or oil, to such a pressure that it will expand and remain expanded, without leaking. Thus there is assurance that lubricant will penetrate between the leaves.



Molded, jointless rubber spring shoe. A nipple for the grease gun is fitted to the under side

Each shoe is molded to suit the spring for which it is intended. The illustration shows one for the transverse front spring of an Austin Seven; either half-shoe can be telescoped easily

PARTS, ACCESSORIES AND PRODUCTION TOOLS

by hand toward the small end for spring inspection, if required, after the clip from the large end has been removed. The rubber composition is said to resist disintegration and penetration by grease, and to prevent the exterior from becoming coated with the tenacious mixture of exuded grease and road dirt generally observable on leather shoes. The cost is approximately the same as for shoes of leather, the material hitherto used almost exclusively in England.

New Tubular Fitting For Aircraft Fuel Lines

THE Sky Specialties Corp., Detroit, Mich., manufacturer of the Heywood starter, has added to its list of products the Hi-Duty Sky-Service connection, designed for copper-tube oil and fuel lines. This connection is of the compression type and is composed of two parts. The first, the body is a forging which is internally machined and threaded. The second forms a nut and sleeve, which are machined in one piece. The sleeve is the cone-shaped part on one end of the nut, which is undercut so that it will easily detach itself and round the tube into shape during the process of tightening into the body. It becomes permanently detached in about one turn after the nut begins to drag or turn hard, making a very slight identation on the copper tube. No soldering or welding is necessary.

Sky-Service tube connections

We are informed that the Sky Specialties Corp. has used this connection for about one year without a single case of a broken tube having come to its attention, and that the connection has been approved by the Department of Commerce for use on oil and fuel lines of licensed aircraft.

Automatic Time Switch for Short Intervals

A NEW automatic time switch Type TSA for closing and opening electric circuits at short predetermined intervals and on a uniform schedule, recently introduced by the General Electric Co., has a wide range of application. It automatically energizes a circuit to control intermittent operation of electric equipment with a time cycle, which may be a few minutes or several hours, repeated continuously. The time cycle depends upon the gearing used, and is fixed in each case at the factory. In certain forms, however, the relative amount of time "on" during the complete time cycle can be varied by the user. The switches are single-pole, with one-way or two-way contacts, and are rated 5 amp. at 115 volts or 2½ amp. at 230 volts. On circuits of higher ampere rating a magnetic switch can be employed in conjunction with the time switch.

BURNISHING PINIONS

(*Continued from page 723*)

that about 60 to 90 pinions may be burnished per hour. As a matter of fact, the actual burnishing time should not exceed ten seconds on each side and allowing ten seconds to change the work, the output should be two pinions per minute or 120 per hour. A set of burnishing gears is expected to produce about 20,000 pinions before it needs replacement or regrinding.

The results of many experiments show conclusively that the character of the generated pinion is improved to the desired degree. No claim is made for any material production in the cost of producing good gears, although actually the net saving is considerable due to the production of uniformly satisfactory gear sets. As mentioned earlier, this burnishing machine is adaptable to all types of bevel gears including straight, spiral, skew and the hypoid.

In closing it might be well to note that this machine may be applied to the burnishing of the ring gear, if this should ever become necessary or advisable. This seems unlikely, however, as a good pinion usually means a good mating pair, the gear being of minor importance by comparison.

Gage Design Standards

A RECOMMENDED Commercial Standard on Plain and Thread Ring Gage Blanks as adopted by the American Gage Design Committee has been issued in pamphlet form by the Bureau of Standards, Washington, D. C.

Tool supervisors and standards departments of large industrial concerns are particularly urged to adopt, as soon as practicable, the American Gage Design Standards as a substitute for any individual standards which may now be employed. The result will inevitably be the elimination of confusion in gage departments and advancement in the direction of economy and quality of product.

Automotive Oddities by Pete Keenan

JAMES WATT, INVENTOR, FORMULATED THE HORSEPOWER UNIT IN 1780 on the basis of
One Horse moving at 2½ Miles per hour and raising a weight of 150.lbs. by means of a rope passed over a pulley - The effort being equal to raising 33.000.lbs. one foot in one minute.
EDDIE GRAF, Parachute Jumper, CAUGHT IN A NET OF ELECTRIC WIRES AFTER A THRILLING JUMP Hanover Field N.J.
SNIFF SNIFF
WHEW
GASOLINE. WAS NEARLY ABANDONED AS A FUEL DURING ITS EXPERIMENTAL STAGES OWING TO ITS AWFUL SMELL.
78 YEARS AGO HENRY AND CLEM STUDEBAKER. STARTED A LITTLE BLACK-SMITH SHOP AT South Bend, WITH A CAPITAL OF $16.00
The Studebaker Net Sales for 1929 Amounted to $145, 303,833.

First with the News

Reliable, Accurate

News of the Industry

PAGE 739 VOLUME 62 *Philadelphia, Saturday, May 10, 1930* NUMBER 19

Output for April Placed at 460,343

N. A. C. C. Estimate Released at Directors' Meeting in Detroit

DETROIT, May 8—The April output of motor vehicles, based on factory shipments, is estimated by the National Automobile Chamber of Commerce as 460,343 units, according to the statement announced at the directors' meeting here yesterday. This is a gain of 9 per cent over the March output. The April, 1929, total, which was the highest monthly output on record, was 663,811 and the April, 1928, total was 434,315.

John N. Willys, newly appointed ambassador to Poland, was guest of honor at the luncheon given by the chamber directors at the Detroit Country Club. Mr. Willys' long service to the automobile industry, including his many years as chairman of the export committee of the chamber and as a director, was cited at the luncheon. He is also secretary of the chamber. Mr. Willys expressed his regret at leaving the automobile industry and gratification at President Hoover's appointment.

Among the topics discussed at the meeting were the tariff situation, both domestic and foreign, and hope was expressed that the tariff abroad will not become prohibitive and in any case not discriminatory. It was remarked generally also that increases in automobile taxation should be considered carefully by the various states in view of the high figure, some $925,000,000, that has already been reached.

Directors of the chamber present were: Alfred Reeves, J. F. Marvin and Pyke Johnson.

Moon and Kissel Merge

ST. LOUIS, May 8—Merger of the Kissel Motor Car Co. of Hartford, Wis. and New Era Motors, Inc., has been announced by William J. Muller, president of the Moon Motor Car Co. As vice-president in charge of engineering for the New Era Motors, Mr. Muller developed the front wheel drive car, which is manufactured by the Moon company, and will be produced by the Kissel company under the new arrangement.

The Moon company is not involved in the deal.

Living Costs Down, Survey Shows

NEW YORK, May 8—With occasional interruptions the cost of living scale has dropped from 68 per cent above that of July, 1914, to 61 per cent, according to a study of "The Cost of Living in the United States," just completed by the National Industrial Conference Board. The study covers the period 1914-1929. It concludes that a general downward tendency is still apparent, and points out the savings possible by taking advantage of seasonal fluctuations in commodity prices.

Studebaker Announces New Lower Priced Six

SOUTH BEND, May 10—The lowest-priced car ever to bear the name of Studebaker is now available, according to announcement just made by Studebaker Corp. of America. The car will be known as the Studebaker Six. Announcement of this Studebaker Six line marks the passing of the Erskine. Prices and specifications of the Studebaker Six are approximately the same as those of the line thus far sold under the Erskine nameplate.

Willys Abandons Elyria Plant

TOLEDO, May 7—Abandonment of the Elyria, Ohio, plant of the Willys-Overland Co. was announced by officials today. Machinery and equipment will be moved to Toledo. The Elyria branch lately has been used for body building and truck assembly. It has operated for 20 years, and reached its peak last summer when 2000 were employed. Truck production will be continued at the Toledo plant.

Murray Reports Profit

DETROIT, May 5—Murray Corp. of America has reported net profit of $295,193 for quarter ended March 31, after all charges and Federal taxes, compared with net profit of $4,957 in preceding quarter, and $784,908 in first quarter of 1929.

Maxim Sails for England

NEW YORK, May 7—Hiram P. Maxim, one of the founders of the Society of Automotive Engineers, sailed today on the Aquitania for England.

Ford Output Ahead of Last Year's Mark

April Production Exceeds March of This Year and April, 1929

DETROIT, May 6—The Ford Motor Co. today announced that its world production of cars and trucks in April was 206,340 units, which was 15,150 units in excess of the total production of 191,190 in April of last year, and 37,295 in excess of the total of 169,045 produced in 1930. The average daily production last month, based on the five-day week, was 9371 cars and trucks.

Of the April total output, 179,149 units were produced in the United States and the rest by the Canadian and overseas Ford plants.

It is generally understood that Ford production will reach a peak of 10,000 units daily this month. Approximately 110,000 men are on the payroll.

The company made known a few days ago that the correct figure for world production of assembled units for the first quarter of this year was 399,321, which compares with 439,956 in the same quarter last year. The 399,321 figure for the quarter this year does not include units produced in knock-down form.

Bendix Has French Unit

PARIS, May 1—Increased activity of the Bendix Corp. on the French market is foreshadowed by the formation of the Societe Bendix, registered under French laws with a capital of 5,000,000 francs with offices at 31 Place Saint Ferdinand, Paris. This company is a holding company controlling the Piganeau-Perrot Brake Co., Bendix Eclipse, and the Stromberg Carburetor Co. Arrangements are being made for the construction in France of Bendix products for automobiles.

March Sales Drop 21% From 1929

PHILADELPHIA, May 8—March registrations of new passenger cars in the United States approximated 298,000 as compared with 378,000 in the same month last year. Total registrations for the first quarter amounted to about 690,000 against 833,000 last year.

Wayne County Sales Gain 20 Per Cent

Ford Registrations in April are 58.4 Per Cent of Total

DETROIT, May 6—New passenger car registrations in Wayne County during April totaled 9476, an increase of 1624, or more than 20 per cent over the total of 7852 for March this year, and a decrease of 5221, or slightly more than 35 per cent from the total of 14,697 for April, 1929. The total to date this year is 26,711, against 41,311 for the same period in 1929, a decrease of 14,600 or more than 30 per cent.

Ford registrations of passenger cars last month totaled 5642 or 58.4 per cent of the total of all makes in the county. Chevrolet ranked second on the list with a total of 1331 passenger cars, while Essex was third with 347, Buick fourth with 238, Pontiac fifth with 234, and Oldsmobile sixth with 209.

Commercial vehicle registrations for the county last month totaled 639, as compared with 598 in March, and with 1081 in April, 1929. Ford was first on the list last month with a total of 408, and Chevrolet ranked second with 110. Total commercial vehicles registered to date was 2104, as compared with 3321 in the corresponding period last year.

S.A.E. Has Aero Meeting

NEW YORK, May 7—The Society of Automotive Engineers, in conjunction with the Aeronautical Chamber of Commerce of America, held a two-day aeronautical meeting here this week as guests of the Metropolitan Section of the former organization. This meeting was held in connection with the New York air show, and took up such subjects as engine design, marine air transport, aircraft design, research, experiment and manufacture. Among the speakers were W. F. Davis, chief engineer of Fairchild Engine Corp.; Giuseppe M. Bellanca, president of Bellanca Aircraft Corp.; Jerome C. Hunsaker, vice-president of Goodyear Zeppelin Corp.; C. H. Schildhauer of the Dornier Corp. of America, and E. E. Wilson, president of Sikorsky Aviation Corp.

Financial Notes

Bohn Aluminum & Brass Corp. has announced net earnings of $395,386 for the first quarter of 1930. This is equivalent to $1.12 a share on 352,418 no-par common shares and compares with $1,019,753, or $2.91 a share on 350,489 shares in the first quarter of 1929.

Ainsworth Mfg. Co. and subsidiaries have reported net income of $146,416 for quarter ended March 31 after charges and Federal taxes, equal to 90 cents a share, par $10 on 162,271 shares, against $232,866 or $2 a share on 116,150 shares in first quarter 1929.

Backstay Welt Co. of Union City, Ind., manufacturers of welts, gimps, bindings, refrigerator gaskets, weatherstripping and decorative conduits for external wiring, has applied for a listing of 100,000 shares of no-par common stock on the Detroit Stock Exchange. Of this total, 80,673 shares are outstanding.

Automotive Brevities

Halsey, Stuart & Co., bankers, Chicago, were sponsors for an advertisement extolling the magnitude of the automotive industry which appeared in the United States Daily on April 16. The advertisement was one of a series devoted to the measures of basic industries.

Arco Co., Cleveland, Ohio, has just published a mixing and matching guide which contains information on colors for the automobile paint shop.

Baldwin, Duckworth Chain Corp. has been formed as a merger of the Baldwin Chain & Mfg. Co., Worcester, Mass., and the Duckworth Chain & Mfg. Co., Springfield, Mass. George H. Encsall of Springfield is president. George D. Gilbert is sales manager of the Duckworth division and Arthur W. Warren sales manager of the Baldwin division. Assets of the new corporation are reported to be in the neighborhood of $2,000,000.

Lincoln Electric Co., Cleveland, has announced the transfer of John C. Murdoch to the Chicago district, R. A. Kyle to the New York district, and Robert Newton to the Cleveland district.

Apex Machine Co., Dayton, Ohio, has issued a new catalog describing various types of chains, chucks and other accessories for machine tools.

Federal Press Co., Elkhart, Ind., has appointed Homer Strong & Co., Inc., Rochester and Buffalo, exclusive representatives in both territories.

American Salpa Corp., manufacturer of rehided leather products, announces the establishment of a national sales organization and the beginning of an extensive national advertising campaign.

Portland Cement Assn. has just published a 20-page booklet describing "Pavement Resurface with Concrete" with many illustrations of resurfacing jobs.

Bunting Brass & Bronze Co., Toledo, has moved its Chicago branch sales office and warehouse to 1221 West Washington Blvd., Chicago, from South Michigan Avenue.

Bacharach Industrial Instrument Co., Pittsburgh, has recently published a catalog covering the Maihak indicating outfit for Diesel engines.

Allis-Chalmers Mfg. Co., Milwaukee, has announced the removal on April 25 of its Chicago district office to 20 N. Wacker Drive, Suite 3101.

General Electric Co., Schenectady, has announced that a gasoline-electric automobile owned by a member of its transportation engineering department has been driven 30,000 miles on the Australian continent, mostly on dirt roads.

Angle Steel Stool Co., Plainwell, Mich., announces that an agency has been appointed in Philadelphia territory and vicinity and will have offices in the Guaranty Industrial Building, Philadelphia.

Adams Grease Gun Corp. announces that a Federal Court decision has been handed down in the suit of the Bassick Mfg. Co. against the Adams Corp. for infringement.

Toledo Scale Co., New York, announces the development of a chassis brake testing auto-gage. It is claimed that the device has a spring testing capacity of 275 springs per hour and so may be placed in the production line without hindering output.

American Hammered Piston Ring Co., Baltimore, has just published a 1930 edition of its piston ring specification book.

Perfex Corp., Milwaukee, announces that April was the largest sales month in the history of the company.

Perfection Gear Co., Chicago, has announced the acquisition of the G. H. Mfg. Co. of Baltimore. The G. H. Mfg. Co. facilities will be removed to Chicago and incorporated in the Perfection plant.

White Motor Co., Cleveland, reports that at the beginning of 1930 there were 1408 companies running 49,250 White trucks and buses in fleets of 10 or more.

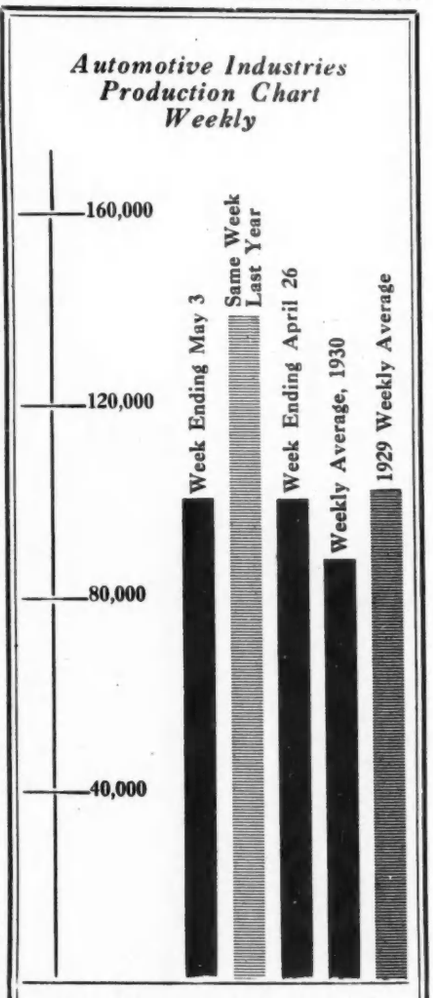
Chrysler April Shipments Increase Beyond March

Gain Is Proportionately Greater Than Last Year

DETROIT, May 5—April shipments of Chrysler built passenger cars, trucks, buses and commercial vehicles totaled 37,527, an increase of 3711 units or 11 per cent over March, as compared with an increase of 9 per cent in April, 1929, over May, 1929. April retail sales of Chrysler Motors products were 32 per cent above sales to the public in March. Field stocks are 39 per cent below what they were at this time last year.

Shipments of cars bearing the Chrysler name were 11,045, the Dodge passenger cars 10,571, Plymouth 8887, and De Soto 4541. In the commercial field Dodge shipped 2170 trucks and buses, and Fargo 313 vehicles.

Shipments of Plymouth cars in April were 70 per cent ahead of March, this increase reflecting the Plymouth price reduction which was effective March 10.



The composite chart appearing above will delineate each week production of passenger cars in the United States and Canada, for the week preceding publication of the issue in which it appears, together with production for the preceding week, and other factors. Data used in compiling it are obtained in confidence from a number of sources. Other factors may be added, dependent upon the cooperation of additional sources of information.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES.

NEW YORK, May 7—Warmer weather throughout the country last week stimulated retail trade. Wholesale and jobbing lines showed little or no improvement. Iron and steel trade declined; cotton, silk, and wool demand improved somewhat. There was a slight reduction in unemployment in some centers in the West. The arrival of the much needed rains in the Southwest benefited the grain and cotton crops.

AGRICULTURE

Crops and spring work in most of the agricultural centers of the country are making normal progress, according to a report issued by the United States Department of Agriculture. Winter wheat is growing rapidly; the sowing of spring wheat is nearly finished, with soil conditions better than those of a year ago.

LUMBER

Overproduction of both hardwoods and softwoods continued during the week ended April 26, according to reports from 874 mills. Orders and shipments were 16 per cent and 13 per cent respectively below production.

CRUDE OIL

Average daily crude oil production for the week ended April 26 amounted to 2,590,100 bbl., as against 2,560,900 bbl. for the preceding week and 2,650,650 bbl. a year ago.

CAR LOADINGS

Railway freight loadings for the week ended April 19 totaled 892,881 cars, which marked a decline of 112,999 cars below those a year ago and a decline of 52,408 cars below those two years ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended May 3 stood at 89.7 per cent, as against 90.2 per cent the week before and 90.7 per cent two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended April 30 were 11 per cent below those a year ago.

BROKERS' LOANS

Brokers' loans in New York City during the week ended April 30 increased $57,000,000. The total increase in the last 9 weeks amounted to $785,000,000.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended April 30 showed increases of $22,000,000 in holdings of discounted bills, of $2,100,000 in holdings of Government securities, and of $21,400,00 in member bank reserve deposits. Holdings of bills bought in the open market declined $47,300,000. The reserve ratio on April 30 was 82.5 per cent, as against 81.8 per cent a week earlier and 80.4 per cent two weeks earlier.

Decline of Raw Material Index to Low Point Attributable to Variety of Market Factors

NEW YORK, May 8—A reduction of two points in the *Automotive Industries* Raw Materials Chart, based on prices in effect on April 15, brings the index to a lower level than it has reached during the past three years. While this reflects the general downward tendency in commodity and raw materials' prices reported elsewhere, a number of special factors have been directly concerned in lowering the cost of automotive raw materials.

One of the outstanding factors in the present recession of raw materials prices was the 4 cents per lb. reduction announced by the copper producers on April 15, which carried the price of electrolytic from 18 cents, a quotation that had been in effect for exactly a year, to 14 cents. Since then the market has yielded further ground, and bid and asked prices seem to have superseded the rule of pegged price levels. Copper is now selling at the most attractive prices obtainable in the last three years, and while some consumers continue to show aloofness as a matter of strategy, the general feeling is that the copper market has turned so sharply in buyers' favor that little is to be gained by deferring reasonable anticipation of consumers' wants.

Tin prices yielded approximately 10 per cent in April, spot Straits, which sold at over 37 cents on April 11, being offered at 34 cents at the close of the month. Pressure on prices has continued since, and early this week the metal was to be had at 32½ cents, the lowest price in eight years. Both lead and zinc prices receded fractionally in April, the former shedding $4 @ $5 a ton and the latter 15 to 20 points.

While in the day-to-day trading in the non-ferrous metals, numerous reasons were advanced for these declines, especially so in copper, for the sharp price drop of which metal dissension in the ranks of the producers was cited by way of partial explanation, the major influence was lack of demand. The general down-trend of commodity prices was more powerful than the technical position of any one of the metals.

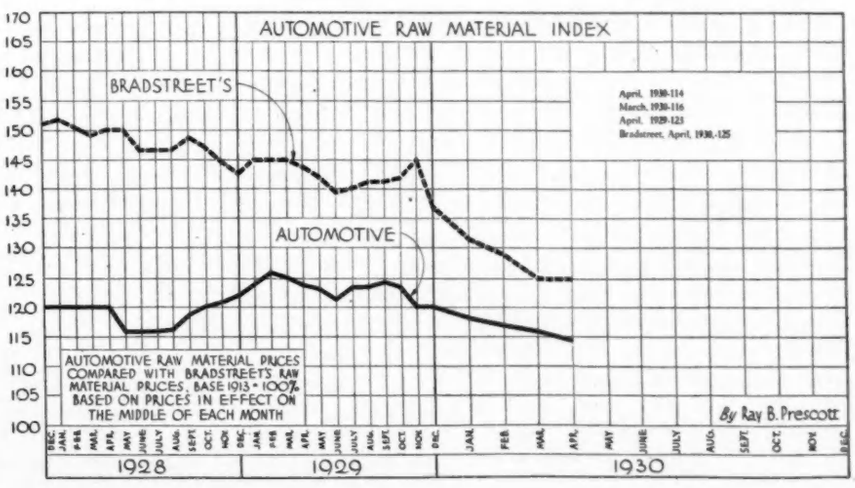
The same major influence of paucity of demand caused steel prices to be whittled down. Intensive competition, especially for business from automotive foundries in the Detroit-Cleveland territory, brought blast furnaces in the more remote districts into a keen contest with those nearer to these markets, and buyers benefited in some instances to the extent of 50 cents a ton.

Shading of steel bar prices to the extent of approximately $1 a ton was general and the market at the end of April was easier than earlier in the month. Competition by light plate mills caused a slight decline in the quotation for blue annealed sheets. There were no out-and-out price reductions in any of the more important descriptions of finished steel entering into automotive consumption, but quotations were generally looked upon as nominal, and a fair appraisal of the market at the end of April shows it to be on a slightly lower level than it had been at the outset of the month.

In the steel market it simmers down to competitive attrition having made for abrasion of prices, a condition which even a slight improvement in the demand is likely to alter. Identically the same state of affairs is noted in the lumber market, in which no out-and-out dips in prices were noted in April, but in which producers contend keenly with one another for every dollar's worth of business that overhangs the market.

Curtailment of supplies by the producers of Far East products—tin and rubber—continues to be on the program, but so far has not succeeded in making very much of a dent in the visible supply of these staples.

Certain it is that such sharp recessions as that in the price of copper can not recur in the near future.



Complete French Tariff Schedule

New Specific Duties on Automobiles

	Unit for Application	Rate of Duty General Tariff Francs	Minimum Tariff Francs
Automobiles:			
1. For transport of persons (with minimum duty of 70 per cent ad valorem in the general tariff and of 45 per cent ad valorem in the minimum tariff). (1) (2)			
(A) Automobiles with bodies, complete or not, weighing each:			
Less than 1100 kilos	100 kilos net	3,200	800
From 1100 kilos, inclusive, to 1500 kilos, exclusive..	100 kilos net	3,700	925
From 1500 kilos, inclusive, to 1750 kilos, exclusive..	100 kilos net	4,200	1,050
From 1750 kilos, inclusive, to 2000 kilos, exclusive..	100 kilos net	5,100	1,275
2000 kilos and above	100 kilos net	6,800	1,550

(1) Spare tires are provided for separately under paragraph 620 of the tariff.

(2) The following parts and accessories are not taxed separately when mounted on the car or chassis: Storage and dry batteries, ignition equipment for internal combustion engines (magnetos, spark plugs and their spare parts), electric lighting and starting equipment (starters), generators or dynamos, instrument boards, regulators, (switches), bulb horns, meters and speedometers, tools, tubes, solid tires and casings, ball bearings, clockwork, spare wheels with or without tires.

	Unit for Application	Rate of Duty General Tariff Francs	Minimum Tariff Francs
(B) Chassis without body, with or without motor, equipped or not with tires:			
(1) For buses, weighing each more than 2000 kilos and providing a space, suitable for attachment of body, of more than 4½ meters	100 kilos net	4,200	1,050
(2) Others, weighing each:			
Less than 850 kilos..	100 kilos net	3,200	800
From 850 kilos, inclusive, to 1250 kilos, exclusive	100 kilos net	3,700	925
From 1250 kilos, inclusive, to 1500 kilos, exclusive ...	100 kilos net	4,200	1,050
From 1500 kilos, inclusive, to 1750 kilos, exclusive ...	100 kilos net	5,100	1,275
1750 kilos and above.	100 kilos net	6,200	1,550
2. For the transport of merchandise (with minimum duty of 70 per cent ad valorem in the general tariff and 45 per cent ad valorem in the minimum tariff). (See notes 1 and 2, page 1.)			
(A) Automobiles equipped with bodies, complete or not, weighing each:			
Less than 1150 kilos..	100 kilos net	2,500	625
More than 1150 kilos..	100 kilos net	2,800	700
(B) Chassis without body, equipped with or without tires	100 kilos net	3,400	850
3. Bodies and parts thereof, equipped with or without furnishings	100 kilos net	3,200	800

Note. Automobiles are subject to following luxury tax: passenger cars, 6 per cent duty-paid value; commercial vehicles, used for transportation of passengers, 3 per cent duty-paid value.

New Specific Rates of Import Duty on Automobile Parts

	Unit for Application	Rate of Duty General Tariff Francs	Minimum Tariff Francs
Accessories, parts and detached pieces for all automotive vehicles, worked or having been subjected to an assembling, an adjusting, or a pressing operation:			
Bumpers and bumper bars, whether or not furnished with their mountings (cushions, elastic or rigid supports, etc.)	100 kilos net	1,600	400
Shock absorbers and their detached pieces	100 kilos net	3,200	800
Mud guards and motor hoods of iron, cast iron or steel, or with these metals predominating by weight	100 kilos net	2,400	600
Thermostatic apparatus	per kilo net	140	35
Shafts and semi-shafts for coupling, gear changing, transmission, grooved shafts, driving shafts, water pump shafts, crankshafts	100 kilos net	5,400	1,350
Assemblies consisting of the following elements, similar assemblies and their separate parts, not elsewhere classified:			
Gear box, transmission ...	100 kilos net	5,200	1,300
Steering, with or without wheel, clutch	100 kilos net	5,600	1,400
Rear axle housing (1)	100 kilos net	4,000	1,000

(1) The "pont-arriere" (rear axle housing) which is imported provided with rear axle tube (funnel shaped rear axle casing) is subject to these duties diminished by 25 per cent.

	Unit for Application	Rate of Duty General Tariff Francs	Minimum Tariff Francs
Explosion or internal combustion motors and gas turbines (1) (2):			
(a) Without electrical equipment or carburetor (3)	100 kilos net	4,000	1,000
(b) with electrical equipment (4), and (or) carburetor	100 kilos net	5,200	1,300
Component parts of motors:			
Cylinders or cast iron and crankcase with cylinders of cast iron	100 kilos net	3,400	850
Flywheels	100 kilos net	2,000	500
Piston rings	per kilo net	240	60
Others	100 kilos net	6,800	1,700
Chassis frames	100 kilos net	2,000	500

(1) Motors having more than four cylinders shall pay the above-mentioned duties increased by 30 per cent.

(2) To be considered as complete, the motor must include notably in addition to the motor itself:
The crankcase, covers and plates containing or protecting the machinery;
Connections to controls;
Ignition devices complete with connections, wires and conduits;
Energy producing apparatus, hydraulic or electric (excepting batteries), or compressed air, whether used as generators or motors.
Governing and regulating instruments and apparatus for ventilation, distribution, carburetion, feeding and refilling, notably fluids necessary for the functioning of the motor, excepting fuel reservoir;
Filters or purifiers if the type of vehicle for which the motor is intended carries them.

(3) Motors weighing less than 200 kilos shall pay the above-mentioned duties diminished by 15 per cent.

(4) Electrical equipment includes: ignition systems complete with contacts, wires, etc., apparatus generating electrical energy (excepting batteries) such as generators and starting motors.

On Automobiles and Accessories

	Unit for Application	Rate of Duty General Tariff Francs	Rate of Duty Minimum Tariff Francs
Carburetors and the like:			
Of steel, cast iron, pure copper or alloy, or nickeled metal	100 kilos net	5,600	1,400
Of pure zinc or zinc alloy	100 kilos net	7,200	1,800
Entirely or partially of aluminum, nickel, magnesium or of any assimilated metal	per kilo net	120	30
Detached parts:			
Cut out or pressed, pipes, floats	100 kilos net	5,600	1,400
Needles, nozzles	per kilo net	280	70
Other pieces	100 kilos net	2,200	1,800
Metal endless tracks (metal caterpillars) for wheels	100 kilos net	1,000	250
Pressure or vacuum gasoline feed systems, exhausters, injectors, economizers, pumps (oil, gasoline and water), centrifugal oil purifiers, stationary oil filters and catalytic heaters	100 kilos net	6,800	1,700
Axles not mounted on wheels	100 kilos net	3,000	750
Axles mounted on wheels (sets of wheels), axle shafts and parts of axles	100 kilos net	4,000	1,000
Brakes and parts of brakes	100 kilos net	3,000	750
Footboards (running boards)	100 kilos net	1,040	260
Gasoline level indicators	each	68	17
Rear vision mirrors	per kilo net	60	15
Windshields and their detached parts, of copper, aluminum, steel, wood, etc.	100 kilos net	5,200	1,300
Rims and bars for rims of iron or steel:			
Straight bars:			
Hot rolled or drawn	100 kilos gross	140	35
Cold rolled or drawn	100 kilos gross	180	45
Rims	100 kilos gross	400	100
Linings for brakes, clutches or other friction mechanisms:			
(a) With base of asbestos, of cellulose, of textiles or other materials in the shape of segments, disks, washers, or bands with or without the addition of common metals, coated with oil varnish, woven or not	100 kilos net	5,600	1,400
(b) The same articles impregnated with a dressing of a resinous base, natural or synthetic, or of natural or artificial rubber	100 kilos net	7,200	1,800
Automatic windshield wipers, other than electric, including also direction indicators and their detached parts	per kilo net	120	30
Sheet metal parts such as dust covers for wheels, chests (trunks), brake drums, tire boxes, instrument boards, shells, tool boxes, fender and footboard supports, license plates, etc.:			
Of iron, cast iron or steel or when these metals predominate in weight	per 100 kilos net	2,000	500
Of copper, pure or alloyed, or when this metal predominates in weight	100 kilos net	3,200	800
Pinions and geared wheels of bronze, aluminum, various alloys, brass and pressed materials	100 kilos net	4,000	1,000
Silencers or exhaust box mufflers, in iron, cast iron, or steel, or when these metals predominate in weight	100 kilos net	1,600	400
Radiators or coolers for water or oil, of pure copper or copper alloy, or when this metal predominates in weight	100 kilos net	2,400	600
Component parts of radiators: radiator shells of any metal, rough, polished, painted, nickeled, chrome finished or treated in any manner whatever, with or without shutters for regulating temperature; separate temperature regulating shutters	100 kilos net	5,000	1,250
Gasoline tanks of copper pure or alloyed or where this metal predominates in weight	100 kilos net	2,400	600
Front and rear laminated springs	100 kilos net	900	225
Wheels or sets of wheels fitted with metal caterpillars, or with pneumatic or solid rubber tires	100 kilos net	1,200	300
Wheels:			
Of iron or pressed steel, for automobile trucks to take solid or block tires	100 kilos gross	240	60
With wooden spokes and rims	100 kilos net	600	150
With spokes of wire, or of iron or steel tubes	100 kilos net	1,200	300
Others	100 kilos gross	500	125
Metal pieces for wheels, such as hubs, spokes, etc.:			
Of steel, iron or cast iron, ordinary or malleable:			
Rough	100 kilos gross	340	85
Worked	100 kilos gross	440	110
Of other metals:			
Rough	100 kilos net	680	170
Worked	100 kilos net	880	220
Steering wheels and their detached parts	100 kilos net	5,200	1,300
Bent wood circles for steering wheels:			
Neither fashioned nor worked	100 kilos net	1,400	350
Fashioned or worked, without ornamentation	100 kilos net	2,800	700
Other pieces and parts (other than rough) not elsewhere taxed, weighing each:			
Less than 500 grams, of any material other than precious metal or fine materials (ivory, shell, mother-of-pearl, amber or imitation amber)	100 kilos net	6,800	1,700
500 grams and more:			
Entirely or partially of aluminum, duralumin, or other light metals	100 kilos net	5,000	1,250
Entirely or partially of nickel, pure or alloyed, or even nickeled	100 kilos net	4,400	1,100
Of pure or alloyed copper or when this metal predominates in weight	100 kilos net	4,000	1,000
Of other common metals	100 kilos net	2,000	500

Leading Steel Producer Revises Code to Market

Talk of Price Cutting War Has No Basis, is View

NEW YORK, May 8—The form in which the leading steel producer's wire-drawing subsidiary announced downward revision of its prices refutes newspaper reports that the Corporation's price policy has undergone a drastic change. The downward revision in wire and wire products prices, which brings them into harmony with the general market, was announced by J. S. Keefe, president of the American Steel & Wire Co., in the following manner:

To conform with trade paper quotations, which represent prices being generally made by other manufacturers, the American Steel & Wire Co. has revised selling prices. These prices represent a reduction of about $2 to $3 a ton from the American Steel & Wire Co.'s schedule which it has been maintaining. The general market having settled down to a lower base, this revision more nearly approximates the prices now current."

In other words, the Corporation, following its well-established policy, has substituted actual prices for a nominal set of quotations which could no longer be maintained. There is nothing in this announcement to indicate that the Codporation has decided upon a more aggressive policy than in the past. It is merely meeting competitors' prices, as it has always done under market conditions, such as those now prevailing.

Talk of a price war in the steel industry has no foundation in fact. There is hardly an item in the finished steel list for which rigid prices may be claimed. All quotations are more or less subject to shading when the tonnage and specifications involved in an individual order and the standing of the consumer make the business desirable.

The Corporation strives to maintain its official quotations on the basis of the actual market. Manufacturers' wire, hard bright and not annealed, is now quotable at 2.30 cents, Pittsburgh.

Pig Iron—Central West furnaces are meeting competition in their territory developed by the movement of iron from the East, and in consequence the market is easier. Demand from automotive foundries is spotty, but quite a little tonnage is being shipped against old contracts.

Aluminum—The market for this metal is quiet, routine conditions prevaling in all departments.

Copper—Domestic consumers were offered copper on Monday at 13 cents. It wasn't so much the second cut in prices in three weeks, aggregating 5 cents, that attracted attention, as the way in which it came about, the procedure differing sharply from that followed in the April 15 reduction. Then the export price was lowered, the domestic quotation following suit. On Monday, two of the leading custom copper refiners offered metal at 13 cents, thus creating the impression that the market had once more become an open affair.

Tin—Another decline featured the week's opening, Straits tin for prompt shipment being available at a shade under 32½ cents. The decline was caused by extreme weakness in London.

Lead—Unchanged and dull.

Zinc—Demand very light. Easy.

Luxury Tax on Cars Reduced in France

WASHINGTON, May 6—The luxury tax assessed upon all automobiles sold in France has been reduced from 10 to 6 per cent on passenger cars, and from 5 to 3 per cent on commercial vehicles used for the transportation of passengers, according to a cable received in the Department of Commerce from Acting Commercial Attache D. J. Reagan, at Paris. The luxury tax is levied upon the duty-paid value in the case of foreign cars and upon the manufacturer's price in the case of domestically manufactured cars.

U.C.C. Reports Progress

DETROIT, May 5—Universal Credit Co., which is associated with the Ford Motor Co., handling its authorized time payment plan, reports that since its establishment in June, 1928, it has opened 30 branch offices covering 35 states, and that during this period nearly 700,000 Ford customers have used the plan. Retail time sales contracts purchased from customers of Ford dealers in 1929, which was the credit company's first complete year of operation, numbered nearly 500,000 for a total dollar volume of nearly $200,000,000. In March this year the company reported a volume of $20,000,000, and in April close to $30,000,000. A total volume of more than $300,000,000 is anticipated for this year.

Plymouth Sales Gain

DETROIT, May 5—A. vanDerZee, general sales manager of Plymouth Motor Corp., has announced that retail sales of Plymouth motor cars in the 34 states which have reported on March registrations thus far show a net gain of 71 per cent over the month of February. Plymouth was placed in the low-price range by the price reductions, which became effective March 10.

Business Use of Vehicles Dominates, Survey Shows

Pennsylvania Report Places Average at 52 Per Cent of Total

HARRISBURG, May 6—Motor vehicle mileage traversed on Pennsylvania's State Highway System totals daily 8,630,000 miles exclusive of truck traffic, according to a report compiled for James L. Stuart, secretary of the Pennsylvania Department of Highways. The report, which concerns utilization of the highways, indicates that 14 per cent of the average daily vehicle-miles are traveled by cars registered outside of Pennsylvania and visiting this Commonwealth on pleasure or business trips.

The report classifies the motor vehicles registered in Pennsylvania as 91 per cent passenger type and 9 per cent truck and bus type. It is estimated that 92.9 per cent of the cars used on the state system of roads are owned by residents of cities and towns, while only 7.1 per cent are the property of rural families.

Cars used for business purposes constitute 52.8 per cent of the daily traffic volume and total 4,557,000 miles of operation. Furthermore, only 5.8 per cent of the volume represents trips of more than one day taken primarily for recreation, indicating the extent to which motor vehicles are being used for business purposes of all classifications.

Goodyear Forms Subsidiary

AKRON, OHIO, May 6—Officials of Goodyear Tire & Rubber Co., have organized Godyear Tire & Rubber Co. of Argentina, Inc., a subsidiary to operate in South America. About 50 acres will be purchased near Buenos Aires as site for mill to manufacture tires, tubes and other rubber products, to cost over $500,000. New company will operate with capital of $600,000. P. W. Litchfield, head of parent organization, will be president of the company and chairman of board.

Rubber Invoiced to U. S.

WASHINGTON, May 6—American consular offices at Singapore, Penang, Colombo, Batavia, Surabaya, Medan, London and Liverpool, whose vise invoices on all rubber shipped to the United States from Malaya, Ceylon, Netherland East Indies, and the United Kingdom, report by cable the following amounts of rubber invoiced during the week ended May 3, as compared to amounts invoiced in 10 preceding weeks:

1930 Week Ended	British Malaya	Ceylon	Netherland East Indies	London and Liverpool	TOTAL
Feb. 22	7,010	1,223	2,389	51	10,673
March 1	8,146	2,315	2,898	57	13,416
March 8	6,637	925	1,990	45	9,597
March 15	6,256	658	1,786	10	8,710
March 22	7,075	753	1,997	19	9,844
March 29	5,867	1,335	1,462	Nil	8,664
April 5	7,435	779	2,109	Nil	10,323
April 12	7,026	1,235	1,527	7	9,795
April 19	6,013	493	1,109	21	7,636
April 26	5,558	642	1,224	Nil	7,424
May 3	7,703	1,384	1,806	25	10,918

All figures in long tons.

Ex-Cell-O Works Acquires Continental Tool Holdings

Exchange of Stock and Cash Basis of Merger

DETROIT, May 5—Terms for the acquisition of the Continental Tool Works by the Ex-Cell-O Aircraft & Tool Corp. have been completed, it was announced today by Baker-Simonds & Co., investment bankers, who completed the deal for Ex-Cell-O. Terms have been agreed to by directors of both concerns. Definite terms of the deal have not yet been announced, but it is understood that the acquisition will be completed through an exchange of stock and a cash consideration. The Continental Tool Works manufactures cutting tools used in the automotive industry, a line closely allied with present production of the Ex-Cell-O Corp.

N. A. Woodworth, president of Ex-Cell-O, in commenting on the acquisition, said in part, "The merger should be beneficial to both concerns. The Continental line, being somewhat different from our line, will round out our production list and the Continental Works will benefit from Ex-Cell-O's extensive sales force."

This latest acquisition is another step in the expansion program inaugurated by the Ex-Cell-O Corp. last year, since which time the corporation has acquired the Airparts & Tool Corp., which in turn was made up of H. R. Krueger & Co., Wolverine Screw Co. and Wayne Tool Co.

Fleetwood Plant Moves

DETROIT, May 5—Removal of the Fleetwood Body Corp. to its plant in Detroit has been completed, according to an announcement by Ernst Schebers, president. The plant has a total floor space of 1,500,000 sq. ft. and the value of the entire property is estimated at $5,000,000.

O. L. Currier, manager of all plant operations, estimates that Fleetwood will employ 3000 men in Detroit. The plant has ample facilities to meet full demands for custom body work that may be made upon it.

In 1929, patronage of Cadillac Motor Car Co. for bodies on the Cadillac and La Salle chassis exceeded $10,000,000. The permanent Fleetwood salon is being retained at 10 East Fifty-seventh St., New York City.

Reo Prices New Truck

DETROIT, May 7—The price of the new Super-Tonner 1-ton Reo truck recently announced has been set at $1,095, this applying to the chassis. The Reo Motor Car Co. has also introduced a new two-speed rear axle transmission available with Reo 3-ton Models GA, GC, GD and GCS. Later this unit will be available for application to the G models now in use.

Reo's new auxiliary transmission, which attaches to the front of the rear axle to form a two-speed rear axle, makes eight speeds available on all Reo Model G 3-ton chassis, with a ratio range of 6.4 in high to 77.8 in low. The two speeds of this unit, direct and 1.92 to 1, are controlled by a short additional shift lever located for convenient operation from the cab.

The two-speed rear axle gear consists of four spur gears which remain constantly in mesh, and a positive clutch of the internal-external-gear type. The countershaft is located below the shaft of the spiral bevel pinion.

General Motors Balance Sheet Compares End of 1929 and First Quarter of 1930

Condensed Consolidated Balance Sheet March 31, 1930, and December 31, 1929

Assets

	Mar. 31, 1930	Dec. 31, 1929
Current Assets:		
Cash	$99,334,152	$101,085,813
United States Government securities	26,480,787	26,265,717
Sight drafts with bills of lading attached, and C. O. D. items	15,512,417	13,579,613
Notes receivable	2,035,579	1,977,363
Accounts receivable and trade acceptances (less reserve for doubtful accounts: in 1930, $1,529,264; in 1929, $1,549,336)	42,942,627	33,866,865
Inventories	195,565,139	188,472,999
Prepaid expenses	3,071,062	3,712,575
Total Current Assets	$384,941,763	$368,960,945
Investments:		
Investments in subsidiary and affiliated companies not consolidated	$213,356,092	$207,270,443
General Motors Corporation capital stocks held in treasury for corporate purposes (in 1930, 1,401,884 shares common; 7182 shares 7 per cent preferred)	46,340,572	69,929,476
Total Investments	$259,696,664	$277,199,919
Fixed Assets:		
Real estate, plants and equipment	$613,629,069	$609,880,375
Deferred expenses	17,472,505	18,168,099
Goodwill, patents, etc.	50,672,754	50,680,426
Total Fixed Assets	$681,774,328	$678,728,900
TOTAL ASSETS	$1,326,412,755	$1,324,889,764

Liabilities, Reserves, and Capital

	Mar. 31, 1930	Dec. 31, 1929
Current Liabilities:		
Accounts payable	$50,355,767	$42,894,667
Taxes, payrolls and sundry accrued items	30,470,022	22,401,424
United States and foreign income taxes	27,275,991	28,701,486
Employees' savings funds, payable within one year	7,433,327	9,010,571
Accrued dividends on preferred and debenture capital stocks	1,615,115	1,615,015
Extra dividend on common capital stock, payable January 3, 1930	.....	13,050,000
Total Current Liabilities	$117,150,222	$117,673,163
Reserves:		
Depreciation of real estate, plants and equipment	$200,607,365	$194,094,963
Employees' investment fund	2,706,718	9,915,825
Employees' savings funds, payable subsequent to one year	34,439,602	32,412,619
Employees' bonus	2,321,013	12,539,544
Sundry contingencies	4,326,189	3,333,577
Total Reserves	$244,400,887	$252,296,528
Capital Stock and Surplus:		
Capital stock of General Motors Corporation:		
Seven per cent preferred* (authorized, $500,000,000)	$135,573,800	$135,513,800
Six per cent preferred (authorized and outstanding)	1,410,500	1,410,500
Six per cent debenture (authorized and outstanding)	1,931,700	1,991,700
Common, $10 par value (authorized, 75,000,000 shares; issued, 43,500,000 shares)	435,000,000	435,000,000
Total Capital Stock	$573,916,000	$573,916,000
Interest of minority stockholders in subsidiary companies with respect to capital and surplus	443,800	443,800
Surplus**	390,501,846	380,560,273
Total Capital Stock and Surplus	$964,861,646	$954,920,073
TOTAL LIABILITIES, RESERVES AND CAPITAL	$1,326,412,755	$1,324,889,764

*The seven per cent preferred capital stock is preferred as to assets and dividends over all other capital stocks of the corporation under charter amendments adopted June 16, 1924.

**Surplus includes $4,978,611 capital surplus at March 31, 1930, and $4,969,611 at Dec. 31, 1929.

Curtice on Community Board

Harlow H. Curtice, president of the AC Spark Plug Co., has accepted a place on the board of trustees of the Flint Community Playhouse Association.

Illinois Sales Decrease

CHICAGO, May 5—Registration of new cars at Springfield, Ill., revealed that sales of automobiles in Illinois during the month of April showed a drop in comparison with a year ago, in spite of the seasonal advance over the March and February figures. New car registrations in Illinois were 22,416 cars during the month, compared with 29,725 for the same period of 1929.

In spite of the common belief that the agricultural regions are a stabilizing influence, the decline in Cook county was not as great as in the balance of the state. Cook county registrations were 11,171.

Men of the Industry and What They Are Doing

United Appoints Oberheu

F. A. Oberheu, for the past year vice-president and director of sales of United Motors Service, Inc., has been appointed president and general manager to succeed Ralph S. Lane, who has been promoted to the central staff of General Motors Corp., doing special assignment work. Simultaneous with his promotion, which is effective immediately, Mr. Oberheu has announced the appointment of H. W. Anderson as vice-president and assistant general manager, United Motors Service. Mr. Oberheu has been with United Motors Service for the past 12 years. For 10 years he was sales manager, and a year ago he was appointed vice-president and director of sales.

Firestone Appoints Morr

Clarence Morr, manager of trade sales of the Firestone Steel Products Co. for eight years, has been appointed sales manager of that company. Mr. Morr came into the Firestone organization in May, 1913, working in the order and production departments until 1916, when he went into rim sales work. He served 18 months in the Army Medical Department during the World War, and returned in 1920 to Steel Products as territory sales representative. Two years later he was made trade sales manager.

Plant Sails for U. S.

A. E. Plant, president of the Chamber of Automotive Industries, New South Wales, Australia, sailed from Sydney on the steamship *Aorangie*, on May 1, and is due to arrive in New York on May 31. Mr. Plant is coming to the United States to study American methods of publicity and marketing of commercial vehicles. Arrangements for his visit are being made by the National Automobile Chamber of Commerce.

Kettering Is on Committee

Charles F. Kettering, president, General Motors Research, and Thomas S. Merrill, secretary, General Motors Corp., are acting as directors of the Greater Detroit Committee, the purpose of which is to attract conventions and tourists to the city of Detroit. At the present time the second city-wide campaign to secure $1,000,000 to carry on this work is being conducted.

Autocar Appoints Moore

W. H. Moore, for many years a member of the White sales organization, has been appointed manager of the national accounts division of the Autocar Co., with headquarters at the Autocar branch in New York City.

Franklin Names Ledyard

Announcement of the appointment of M. K. Ledyard to head the custom body sales department of the Franklin Automobile Co. was made here this week. Before joining the Franklin company, Mr. Ledyard was sales representative for Dietrich, Inc.

Philadelphia Section Elects Neil

Edmund B. Neil, director of research, Chilton Class Journal Co., was elected chairman of the Philadelphia Section, S.A.E., Monday night. Other officers named were W. Lawrence Le Plage, vice-chairman; L. E. Lighton, treasurer, and J. P. Stewart, secretary. Capt. Dalton Risley, Jr., retired as section chairman.

Brede Appoints Miller

O. M. Brede, director of service of General Motors Truck Corp., Pontiac, Mich., has announced the appointment of M. K. Miller, as service promotion manager. Mr. Miller was formerly engaged in service promotional activities of the Chevrolet Motor Co.

Hercules Names Smith

Lon R. Smith has been appointed assistant director of sales for the Hercules Motors Corp. of Canton, Ohio. His new duties will include supervision of export sales, and sales promotion among Hercules distributors.

Smith is on Program

NEW YORK, May 8—Edgar W. Smith, assistant to the president of the General Motors Export Corp., will be among the speakers at the annual spring convention of the American Management Association, to be held at the Hotel Astor, May 12-14. Mr. Smith will speak on "Organization and Operating Principles," including a discussion of the methods of the Export Division of General Motors.

Also included on the program is an address by Ray B. Prescott, marketing counselor, and compiler of the *Automotive Industries* Index of Raw Material Prices.

Mack Profit Decreases

NEW YORK, May 7—Mack Trucks, Inc., reports net profit for the quarter ended March 31, of $490,709 after all charges. This is equivalent to 64 cents a share on outstanding common stock, and compares with earnings of $1,429,587 or $1.89 a share on stock outstanding at the end of the corresponding period of last year.

C.I.T. Adds Contract

NEW YORK, May 8—A contract has been signed by the American Aeronautical Corp., New York, with the Commercial Investment Trust Corp., whereby C.I.T. will act as the official financing organization for this manufacturer's dealers and distributors.

Oakland Names Zetterholm

W. A. Blees, vice-president in charge of sales for Oakland Motor Car Co., has announced the appointment of M. E. Zetterholm, for several months past, assistant to the vice-president in charge of sales, as eastern sales manager. Mr. Zetterholm joined the Oakland organization March, 1926, and was assigned to the Omaha zone sales staff. He later became special representative, assistant zone manager at New York, and zone manager at Pittsburgh. Prior to joining the Oakland organization he had considerable experience in banking and law.

White Promotes Triebner

F. E. Triebner, district manager for the White company at Pittsburgh, has been appointed acting regional manager for the central region of that company.

Mr. Triebner has been with the White company for the past 13 years, having joined the company in November, 1917, in the special sales department. In 1923, he was promoted to manager of the national sales department, going to Pittsburgh in 1926, as district manager.

Strough Joins Bit Company

J. F. Strough, former secretary-treasurer of the Timken Roller Bearing Co., has accepted the presidency of the Detachable Bit Corp. of America, according to advices from Milwaukee. The corporation is located in New York City.

Mr. Strough has left the city, and will begin his new duties immediately. He has been succeeded at the Timken company by Robert Brower.

Coburn Replaces Reed

C. S. Reed, president of Fairchild Aviation Corp., manufacturing subsidiary of the Aviation Corp., has resigned his office in order to devote his entire attention to a business in the middle west in which he has personal interests. Frederic G. Coburn, president of the Aviation Corp., was elected president of the Fairchild company.

Federal Elects Krohn

Henry Krohn, who for the past several months has been general sales manager of the Federal Motor Truck Co., was elected vice-president in charge of sales this week by the directors following the annual stockholders' meeting of the company. Other officers and directors of the company were re-elected.

Doss Leaves Ford

H. C. Doss, for the last five years manager of the Ford Motor Co. plant in Kansas City, has resigned from the Ford organization.

Entrants for Indianapolis Classic Total 43, Including Score of Speedway Veterans

PHILADELPHIA, May 6—William "Bill" Sturm, who has been associated for years with activities of the Indianapolis Decoration Day races, told the Philadelphia Section, S.A.E., last night, that he did not expect to see any of this year's entries for the 500-mile classic average more than 95 m.p.h. for the distance. He pointed out that there has proved to be nothing in this year's rules to prevent the entry of expensive cars, a contention raised in *Automotive Industries* by Fred Moskovics. One car, he said, will cost nearly $18,000. The following entrants and drivers have been announced:

Entrant	Car	Driver
Bill White	Miller Hi-Speed Spl.	William "Shorty" Cantlon
Leslie Allen	Unnamed	Leslie Allen
Alfieri Maserati	Maserati	Baconi Borzacchini
Juan Gaudino	Chrysler	Juan Gaudino
Coleman Motors Corp.	Coleman Front-Drive	Phil Shafer
Coleman Motors Corp.	Coleman Front-Drive	Lou Moore
Alden Sampson, II	Sampson Special	Louis Meyer
Peter De Paolo	Duesenberg	Peter De Paolo
Peter De Paolo	Duesenberg	Unnamed
Harry Hartz	Miller Front-Drive	Harry Hartz
Zeke Meyer	Unnamed	Zeke Meyer
Allen Guiberson	Guiberson Spl.	Ernie Triplett
Louis F. Schneider	Unnamed	Louis F. Schneider
James Talbot, Jr.	Mavv Carburetor Spl.	Anthony Gulotta
James Talbot, Jr.	Mavv Carburetor Spl.	Melvin Kenealy
Julius Claude Slade	Slade Special	J. C. Slade
Wm. Alberti	Duesenberg Spl.	Unnamed
Empire State Motors, Inc.	Empire State Spl.	Wilbur Shaw
James H. Booth	Buckeye Special	Chester Gardner
Bessie Decker	Decker Spl.	Rick Decker
Milton Jones	Stutz	Unnamed
Russell Snowberger	Russell Eight	Russell Snowberger
du Pont Motors, Inc.	du Pont	Chas. Moran, Jr.
Fred M. Fansin	Fansin Jr. Spl.	Fred M. Fansin
Morton & Brett	Morton & Brett Spl.	James Klemos
Wm. H. Richards	Romthe Spl.	J. C. MacDonald
George A Henry	Unnamed	Cy Marshall
Harry A. Butcher	Butcher Bros. Spl.	Harry A. Butcher
Ira Vail	V-Eight	Claude Burton
David Evans	Unnamed	David Evans
M. A. Yagle	Betholine Special	Frank Farmer
W. H. Gardner	Unnamed	W. H. Gardner
Thos. J. Mulligan	Fronty Special	Chester Miller
Letterio Piccolo Cucinatto	Maserati Spl.	Letterio P. Cucinatto
Auto Eng. & Machine Co.	Ambler Special	G. D. MacKenzie
Garbriel Nardi	Nardi Spl.	Wm. Denver
M. M. Lain	Trexler Special	Marion Trexler
Henry Maley	Duesenberg Spl.	Deacon Litz
Herman N. Gauss	Unnamed	Johnny Seymour
Herman N. Gauss	Unnamed	Joe Huff
Clemons Motors, Inc.	Hoosier Pete Spl.	Unnamed
A. R. Duesenberg	Duesenberg Spl.	Egbert "Babe" Stapp
A. R. Duesenberg	Duesenberg Spl.	Unnamed

Rubber Tapping Suspended

NEW YORK, May 6—More than 90 per cent of the Far Eastern rubber producers suspended production May 1 in accordance with the plan to stop tapping of rubber trees during the entire month of May. As a result, the rubber producing companies in Malaya and the Dutch East Indies will now ship out of stocks on hand to fill contracts with consumers in America and elsewhere.

Marmon Give Stock Dividend

INDIANAPOLIS, May 5—Directors of the Marmon Motor Car Co. today declared a 2 per cent common stock dividend payable June 2, to stockholders of record at the close of business May 19.

At the directors' meeting, G. M. Williams, Marmon president, reported a healthy increase in retail sales of all Marmon models, the total for April being approximately 31 per cent ahead of March. Mr. Williams also stated that dealer stocks were being maintained at a level of only approximately two and one-half cars per dealer.

Ford Adds Two Planes

DETROIT, May 6—Two new regular models of Ford all-metal trimotor airplanes, one powered with three Packard Diesel radial air-cooled motors, the other with three of the new Pratt & Whitney Wasp Junior engines, were announced today by the Ford Motor Co. The plane, powered by Packard Diesel engines, will be known as Model 11-A.

Price Changes Reflect French Tariff Increase

Fiat Leads Move to Increase List to Consumer

PARIS, April 25—Increases in the price of all foreign automobiles sold on the French market may be expected during the next few days as the result of the change from ad valorem to specific duties just gone into effect. The first move in this direction was taken by the Italian Fiat, which added 2000 francs to the selling price of its cheapest model, a 4-cylinder of 9 hp. American importers have not yet announced their increases, for they have not been able to ascertain how the new tariff will be applied.

At some ports the custom officials claim that they have no scales and arbitrarily apply the 45 per cent ad valorem duty. At other points it is being claimed that the weight of cars should be taken in full running order, filled with water, gasoline and oil. This of course will be contested.

General Motors state that their price increases, to go into effect on May 1, will vary from 5 to 15 per cent, and that because of the new tariff some models will have to be withdrawn from the French market. While the importers are preparing to increase, Citroen has announced a slight decrease, representing 4 per cent off the state luxury tax.

Moreland Adds Model

LOS ANGELES, May 7—B-Liner, also designated as Model DB-7, is the name of a new six-wheel truck of about five tons capacity offered by the Moreland Motor Truck Co. With a gross weight rating of 16,000 lb. and a chassis weight of 6000 lb., the B-Liner has a chassis capacity of 10,000 lb., which is comparatively light in the six-wheel field.

This model is offered in 160 or 184 in. wheelbase and is equipped with a six-cylinder engine, four-speed transmission, Timken tandem axle and Lockheed four-wheel brakes. Power is furnished by a rubber-mounted Hercules Model WXB 3¾ x 4½-in. engine developing 67 hp. at 2400 r.p.m. Auto-Lite electrical equipment is supplied and the cooling system includes a fin and tube radiator.

Oregon Section Elects

PORTLAND, ORE., May 5—New officers of the Oregon section, Society of Automotive Engineers, who will be voted into office at the May meeting are: H. W. Drake, chairman; vice-chairman, C. C. Humber, Longview Transportation Co.; second vice-chairman, E. J. Blaser, Factory Motor Car Co.; third vice-chairman, F. G. Baender, Oregon State College; treasurer, J. V. Savage, municipal shops; secretary, F. P. Myers, Myers-Blackwell Company.

At the April meeting, papers were presented on tractors in the logging industry, and the truck in the logging industry.

Automotive Construction Reaches Higher Level

Machine Tool Sales Generally Hold Pace

PHILADELPHIA, May 8—Construction in the automotive field took a second leap this week, and a new record for the year was established. Announcements in the parts field led, and airport construction, including several large reconditioning shops showed an increase over last week. Machine tool sales generally were good, but were spotty in the Pittsburgh area. Among the announcements made this week were:

Ditch, Bowers & Taylor, Inc., Baltimore, operating service and repair works, awarded general contract to Charles Stockhausen Co., Inc., for rebuilding three-story plant recently destroyed by fire, with loss of about $125,000 including equipment.

U. S. Navy Bureau of Yards and Docks, Washington, has been authorized to arrange for following work: San Diego, Calif., metal aircraft structure shop, $130,000, seven aircraft hangars with repair facilities, $275,000; hangar at naval air station, Pearl Harbor, Hawaii, $224,000 with equipment; shop for aircraft repairs and overhauling at naval air station, Coco Solo, Canal Zone, $90,000.

United States Rubber Co., New York, is planning expansion for tire cord production at Winnsboro, S. C., to cost about $200,000 with equipment.

Joseph Evans Sperry, Baltimore, architect, will take bids for multi-story automobile service, repair and garage building, to cost about $200,000 with equipment.

David Polnoroff, Philadelphia, has leased space in building at 1818 Ridge Ave., to manufacture automobile fenders and other sheet metal products.

Horace W. Castor, Philadelphia, architect, asked bids on revised plans for automobile service, repair and garage building, to cost about $100,000 with equipment.

Easton Airport Corp., Easton, Pa., considering establishment of airport, with hangars, repair shop and other field units, to cost over $100,000 with equipment.

Heil Co., Milwaukee (steel tanks, dump bodies, hydraulic hoists, motor truck equipment), has acquired manufacturing rights on a portable drying machine, heretofore built in small quantities by Arnold Drier Co., Galesville, Wis., and is planning erection of an addition, 200 ft. sq., part two stories, to cost about $150,000. Julius P. Heil, president of Heil Co., has become vice-president of Arnold Drier Co. G. D. Arnold is president.

Briggs & Stratton, Corp., Milwaukee, is awarding contracts for a sixth story addition to its main works, adding about 18,000 sq. ft. of manufacturing space, for production of automobile locks and switches, window lifters, light gasoline engines, etc.

A. O. Smith Corp., Milwaukee, is taking bids through Holabird & Root, architects, Chicago, for new administration and research building, eight stories and basement, to cost about $750,000. E. W. Burgess is chief plant layout engineer.

Muskegon Motor Specialties Co., Muskegon, Mich. (automobile equipment and accessories), is arranging for merger with Jackson Motor Shaft Co., Jackson, Mich., manufacturer of kindred products and will increase capacity. First-noted company will increase capital from 187,500 to 500,000 shares of stock, no par value, part of proceeds to be used for consolidation and expansion.

Cadillac Motor Car Co., Detroit, planning manufacture of V-type engines for aircraft and marine service, and will develop facilities for this production.

City Council, Des Moines, Iowa, considering construction of municipal airport, including hangar, repair shops, oil storage and other field units, to cost over $250,000. City engineering department will be in charge.

Guide Lamp Corp., Anderson (automobile lamps, headlights, etc.), a subsidiary of General Motors Corp., planning addition, totaling about 100,000 sq. ft. floor space, to cost over $400,000 with machinery. Fred S. Kimmerling is president and general manager.

Richard Z. Dawson, Columbus, Ohio, architect, has plans for airplane hangar at Columbus airport, including repair and reconditioning facilities, to cost about $125,000 with equipment, for company whose name is temporarily withheld.

Douglas Aircraft Co., Inc., Santa Monica, Calif. (airplanes and parts), plans addition at Clover Field, to cost over $75,000 with equipment.

Alameda Airport, Inc., Alameda, Calif., has awarded a general contract to Lindgren & Swinerton, Inc., San Francisco, for hangar, with repair shop and other mechanical facilities, to cost about $100,000 with equipment.

Santa Catalina Island Co., Avalon, Catalina Island, Calif., considering airplane landing field, to include hangar with repair facilities and other structures to cost over $80,000 with equipment. D. M. Renton is general manager.

Blue Leads Colors, Index Shows

NEW YORK, May 8—Blue has been definitely reinstated as the most important automobile color family, according to the April issue of the Automobile Color Index, published by the Duco Color Advisory Service. The relative position of the six color families during March, with their corresponding index numbers are: 1, blue, 175; 2, black, 156; 3, brown, 91; 4, green, 82; 5, maroon, 73; and 6, grey, 18.

Carolina Sales Increase

CHARLOTTE, May 6—Steadily increasing demand for Ford products has caused stepping up of production at the company's Charlotte assembly plant, from 107 to 186 cars per day. With other increases in output in early prospect, the number of employees at the plant was increased by more than 250 to 1000 men. Improving demand for Ford cars recently has brought to this plant orders for immediate delivery from dealers in other eastern territories. At the same time the demand in the Carolinas, where dealers until recently were well stocked, has experienced a sharp upturn. The Buick zone headquarters here is moving about 100 cars per week into dealers' hands, and the Chevrolet zone office, about 125 cars weekly in response to the rapidly broadening demand in the Carolinas' automotive trade.

American Chain Seeks Plant

YORK, PA., May 5—The American Chain Company, Inc., with headquarters in Bridgeport, Conn., and four plants in York, is reported to be negotiating for the purchase of the planing mills and lumber yards of Jacob Beitzel and Sons, York. The American Chain Company produces automobile accessories of various kinds, but has not indicated the future use of the addition under consideration.

Franklin Business Increases

SYRACUSE, May 6—Retail delivery of 3779 air-cooled Franklin cars the first four months of the current year is the largest four months' business in the history of the Franklin Automobile Co., exceeding by three per cent retail deliveries of the same period of last year, which up to this time was the high mark.

Delco Light Completes Shift to Rochester Plant

Will Begin Manufacture of New Product

ROCHESTER, N. Y., May 5—The Delco Light Co. has completed moving of its factory, office equipment and personnel here, and has started regular production at the former plant of the North East Electric Co. in Lyell Avenue. The plan of operation calls for the North East Appliance Corp., which was taken over by General Motors last year, to manufacture the Delco products, while the Delco Light Company will handle sales and service.

A staff of 175 Delco executives and manufacturing experts have been brought here under Harry W. Arnold, general manager. Mr. Arnold said the firm's annual business will run $20,000,000 with $500,000 in orders already on the books. Production will be started here soon for the first time on a new Delco product—a gas compressor for rural dwellers to supplement electric service.

Factory Shipments

Cadillac Shipments Increase

DETROIT, May 5—Lawrence P. Fisher, president of the Cadillac Motor Car Co., has announced shipments of the Cadillac V-16 for April of 576 cars, representing an increase of 34 per cent over March. April shipments of the Cadillac V-8 represent a gain over March of 57 per cent. LaSalle April shipments are larger than March by 27 per cent. Total April shipments of all three cars are almost 37 per cent ahead of March.

Buick Shipments Gain

DETROIT, May 5—Buick Motor Co., Flint, has reported shipments of 9601 Buick and Marquette cars in April, against 8760 in March, and 11,119 in April, 1929. May schedule calls for an output of 9374 cars.

Reo Shipments Decline

DETROIT, May 5—Reo Motor Car Co., Lansing, has reported shipments of 2647 cars and trucks in April, as compared with 2870 in March, and 5716 in April last year.

Hupp Reports Shipments

DETROIT, May 5—Hupp Motor Car Co. has reported shipments of 3248 cars in April, compared with 3212 in March, and 6118 in April, 1929.

Graham Output Increases

DETROIT, May 5—Graham-Paige Corp. has reported April production of 6754 units, compared with 4937 in March, an increase of 1817, or 37 per cent. Production during the first four months of this year amounted to 18,428.

French Registrations Gain 17.6 Per Cent During '29

Trucks and Motorcycles Have the Increase

PARIS, April 26—France had 1,322,387 automobiles in service at the end of the year 1929, according to figures just issued by the Ministry of Finance. This total comprised 956,380 passenger cars and 366,007 trucks, buses and coaches, and is an increase of 206,546, or 17.6 per cent, during the year. The percentage increase on trucks only was 10.3. Motorcycles increased by 77,379 during the year, reaching a total of 379,293, giving a total of automobile vehicles of all types of 1,701,680.

Of the private cars 856,547 were rated at less than 9 hp., and 73,613 were of more than 9 hp. The number of light trucks rated from a taxation standpoint at less than 9 hp. was 256,598, and of more than 9 hp. 108,423. The total amount of direct horsepower tax paid to the government was $31,170,000, but in addition to this, important amounts were paid in local, gasoline, oil, and other indirect taxes. Paris and district has the greatest automobile density, with 163,192 passenger cars and 44,065 trucks.

Stewart Has New Model

BUFFALO, May 5—Purchasers of a new 1¼-ton truck, manufactured by the Stewart Motor Corp., will be given an option on either a four-cylinder or a six-cylinder engine, the price being the same in both cases—$1,195 for the 130-in. wheelbase chassis with four-speed transmission and four-wheel brakes. This same chassis is also being offered in longer wheelbases.

Five types of stock bodies are built for this model, namely, panel, covered express, open express, stake and farm. The four-cylinder engine is a 3¾ by 5 in. Lycoming, developing 42 hp. at 2200 r.p.m.; while the six, also a Lycoming, has a 3¼-in. bore and 4½-in. stroke and develops 61 hp. at 2600 r.p.m.

Muskegon Profit Decreases

MUSKEGON, MICH., May 5—Muskegon Motor Specialties Co., for the first quarter of 1930, reports a net income of $100,551, after all charges and taxes, as compared with $140,656 in the corresponding period of 1929. The 1930 net is equal to $1.60 a share on the 62,500 shares of class A stock and, after the dividend provision of 50 cents a share for the period, is equivalent to 55 cents a share on the 125,000 shares of common outstanding, against $2.25 and 87 cents a share, respectively, in the first three months of 1929.

The relatively good showing for the quarter is attributed by Fred L. Flanders, chairman of the board, to the fact that the company supplies camshafts to many concerns outside the general automotive field and the slowing up of passenger car production has, therefore, not been felt so severely as by other concerns.

One in Four Patents is Automotive

NEW YORK, May 6—One out of every four patents on file in the U. S. Patent Office pertains to the automotive industry. This percentage is arrived at by W. L. Powlison, librarian of the National Automobile Chamber of Commerce, who in the past 12 years has covered every new patent, and recently completed his five hundred thousandth copy.

Operating Certificate for Planes Required

WASHINGTON, May 10—For the purpose of surrounding air lines engaged in the scheduled transportation of passengers in interstate commerce with all possible safeguards and with the view of providing air transportation with virtually the same uniformity of operation as is now enjoyed by the major railroads and steamship systems, the Department of Commerce has prepared and promulgated a supplement to the Air Commerce Regulations requiring the operators of scheduled air passenger transport services in interstate commerce, to obtain from the Secretary of Commerce a certificate of authority to operate such scheduled service.

Power Congress Topics Set

PHILADELPHIA, May 6—A list of the papers to be presented to the Second World Power Congress, which is to be held at Berlin, Germany, June 15-26, has been received. Most of the approximately four-hundred papers and reports deal with topics relating to power generation in central stations and on board ship, but a number of papers of direct and indirect automotive interest are also included in the list. Section 28 of the Congress will deal with the production of natural and synthetic oils, their treatment and their properties as motor fuels; Section 29 with stationary internal combustion engines and research work in connection therewith; Section 30 with automobile and aircraft engines; Section 31 with mechanical transmission of power on vehicles and in factories; Section 32 with research work.

New Way Ordered Sold

DETROIT, May 5—Dissolution of the New Way Motor Co., Lansing, Mich., has been ordered by Judge Leland W. Carr, Ingham County Circuit Court, following a hearing on the petition of the directors, and J. W. Wilford, president of the Bank of Lansing, has been named permanent receiver.

It is understood that the business is to be sold as a going concern if the receiver is successful in finding a buyer. If this plan cannot be carried out the property to go at a receiver's sale.

New York Aircraft Salon Includes New Exhibits

Several Planes and One Engine Shown for First Time

NEW YORK, May 5—New York's aircraft salon opened May 3 at the Madison Square Garden with 41 manufacturers of airplanes exhibiting between 40 and 50 airplanes and 15 engine manufacturers exhibiting around 40 engines. All the planes on exhibit are commercial planes, six of them being heavy, multi-motored transport planes, with the remainder lighter single motored sports, business and light transport planes. The bulk of the motors shown are radial air-cooled engines, although there are seven air-cooled in-line jobs on exhibit and four liquid-cooled jobs.

Some few of the planes shown made their first appearance at this show. Among these is the Sikorsky S39, a four-passenger, single motor amphibion, differing from its companions in the Sikorsky line primarily in being a smaller ship with less passenger capacity and employing only one engine. Another is the Eastman Flying Yacht, manufactured by the Detroit Aircraft Corp., a four-passenger open cockpit flying boat. This has two compartments providing for two passengers sitting side by side in each, with control available to the left-hand passenger in either compartment. Another newcomer is the Huntington Governor, manufactured by the Huntington Aircraft Corp., Bridgeport, Conn. This is a two-passenger monoplane, with the cabin fitted to resemble the front seat section of a closed automobile. This job is a full cantilever monoplane, powered with a 110 hp. Warner engine, and capable of cruising at 100 m.p.h.

Engineers Aircraft Exhibits

Then there is the Engineers Aircraft Corp.'s EAC-1, an open cockpit monoplane, with a marked sweepback to its wings, which are of the parasol type. Seating in this two-place plane is also side by side, and it also embodies one or two rather unusual mechanical features. Another is the Fernic two-passenger monoplane, unique in that it carries a small auxiliary wing in front of the main wing to minimize the danger of tailspinning. This plane also has a three-wheel landing gear, the third wheel being under the nose, instead of under the tail, so that when on the ground the ship is in position to take off with a minimum run. Then there is a two-place, open cockpit experimental job entered by the Continental Aircraft Co.

Among the engines, the newest is an 18-cyl. 1800 hp. Isotta-Fraschini, shown to the public for the first time here. This is a liquid-cooled engine with the cylinders in three banks, and was designed for the Italian Military Aeronautical Department. Special permission was secured from Premier Mussolini to exhibit this engine. There are also a number of exhibits of gliders.

International Standards Discussed at Meeting

Pedals, Gear Levers, Springs and Shock Absorbers Considered

PARIS, April 26 — Twenty-seven foreign delegates, representing the United States, Germany, France, Poland, Switzerland and Czecho-Slovakia, attended the third international conference of the International Standard Association, held in Milan last week. The American delegate was William Finger, Automotive Trade Commissioner to Europe, acting as representative of the American Standard Association and the Society of Automotive Engineers.

This is the first time the association has met in Italy, and the Italian interests represented were the Ministry of War, the Ministry of Economy, the Ministry of Civil Mobilization, and the Air Service and Navy. Factory representatives attended from Fiat, Alfa Romeo, Lancia, Itala, Ansaldo, Citroen, Pirelli, Michelin, Bosch and Marelli. Matters discussed by the technical committee were standardization of pedals, change speed lever, shock absorbers and springs.

Cutler-Hammer Buys Union

MILWAUKEE, WIS., May 5—Cutler-Hammer, Inc., has acquired the assets of the Union Electric Mfg. Co., specialists in the manufacturing of a complete line of drum-type control apparatus.

The branch sales offices and warehouse stocks of Union Electric will be consolidated immediately with the Cutler-Hammer branch offices and warehouses, and the present Union Electric factory will be operated as a manufacturing division of Cutler-Hammer.

E. F. Le Noir, president of the Union Electric Mfg. Co., will become a member of the headquarters sales staff of Cutler-Hammer.

Oil Equipment to be Displayed

CHICAGO, May 5—A complete display of equipment and products used by automobile dealers, service stations, garages and filling stations will have a prominent place in the oil equipment exhibit of Chicago, which is soon to open in the new 201 North Wells Building.

Feature Issues of Chilton Class Journal Publications

Chilton Automotive Multi-Guide, First Semi-annual Issue.

Ready in May

Chrysler Car Lowers Paris-Nice Record

PARIS, April 18—Driving a Chrysler roadster, Henri Stoffel last week covered the distance of 550 miles from Paris to Nice in 10 hrs. 27 min., thus averaging 52.6 m.p.h. all stops included, and breaking all existing records.

As the outcome of this performance the French Automobile Manufacturers Association has threatened to exclude Chrysler from the next Paris Salon, for under the rules no exhibitor must take part in a speed test or a performance of any kind unless controlled by the National Automobile Club.

Nash Orders Improve

CHICAGO May 5—The first fifteen days in April brought a decided upward trend in the national demand for Nash "400" cars and a marked improvement in April business at Nash factories, according to C. H. Bliss, sales manager of the Nash Motors Co.

"During this fifteen-day period, orders for April shipment of Nash cars to distributors and dealers increased 43.8 per cent over the same period last year," he said, in commenting on the steady improvement of business. From March 1 to March 15, the increase in orders was 24 per cent.

Studebaker Stocks Reduced

SOUTH BEND, May 6—Studebaker Corp. reports total unsold stocks of new cars in the United States on April 20, this year, were 16,834 compared with 25,711 on the corresponding date of 1929, a reduction of 8877, or more than 34 per cent. The company's stocks amounted to 3396 cars compared with 6152 a year ago, while dealers reported 13,438 cars on hand, against 19,559 on April 20, 1929.

Chrysler Gets Regular Quarterly Cash Dividend

Net Profit for the Period Reached $180,717

NEW YORK, May 5—Chrysler Corp. directors declared May 2 the regular quarterly dividend of 75 cents per share on the common stock of the corporation payable June 30 to stockholders of record June 2, 1930. This is the corporation's eighteenth consecutive cash dividend.

Net profits for the first quarter ended March 31, 1930, after provision for taxes, interest charges and depreciation amounted to $180,717.06. Net current assets as of March 31 were $71,764,873.95, an increase of $379,795.87 for the quarter. Compared with March 31, 1929, net current assets decreased only $6,642,731.49, notwithstanding the retirement since that date of $9,639,500 of debt and the payment of dividends amounting to $10,041,453.

The ratio of current assets to current liabilities, after providing for first quarter dividends, was 4.05 to 1, as compared with 2.77 to 1 on March 31, 1929.

Motor Stocks Decline

NEW YORK, May 7—Seven motors stocks listed on the New York Stock Exchange declined $234,114,000 in market value during the month of April, according to the monthly market review of Frazier, Jelke & Co. This was a decrease of 7.8 per cent, compared with prices which were tabulated on March 31.

Plans Mass Vacation

CHICAGO, May 5—Because of the success last year of its experiment in sending the 35,000 workers at the Western Electric Co.'s Hawthorne works on vacation in two shifts, the company this year will shut down its big plant completely for a two-weeks' vacation period in July.

Indianapolis Tickets in Demand

INDIANAPOLIS, May 7 — Sale of seats for the Decoration Day races here are 33 per cent ahead of last year, to date, according to A.A.A. officials in charge of the arrangements.

Calendar of Coming Events

SHOWS

Berlin, International Automobile..Nov. 6-16

CONVENTIONS

National Association of Credit Men, Annual Convention, Dallas ..May 12-16
National Aeronautic Meeting (Auspices A.S.M.E.), Dayton, Ohio ....May 19-22
National Foreign Trade Conference, Los Angeles .....May 21-23
Society of Automotive Engineers, Summer Meeting, French Lick Springs May 25-29
Automotive Engine Rebuilders' Association, Convention, Chicago..May 26-28
National Conference on Street and Highway Safety, Washington..May 27-29
National Automobile Chamber of Commerce, Annual Meeting, New York June 5
A. S. M. E., Semi-Annual Meeting, Detroit .....June 9-12
A. S. M. E., Oil, Power & Gas Div. State College, Pa. .....June 12-14
World Power Conference, Berlin..June 16-25
Railway Supply Mfrs. Assn., Meeting and Exhibit, Atlantic City..June 18-25
American Railway Association, San Francisco .....June 23-26
American Society for Testing Materials, Annual Meeting, Atlantic City .....June 23-27
Steel Founders Soc. (Midsummer Convention) White Sulphur Springs June 26-28
Eastern States Exposition, Springfield, Mass. .....Sept. 14-20
National Safety Council, Annual Safety Congress, Pittsburgh....Sept. 29-Oct. 4
Sixth International Road Congress, Washington, D. C. .....Oct. 6-11
Exhibition—American Roadbuilders Association, Washington, D. C....Oct. 6-11
Motor and Equipment Association, Convention, Cleveland.....Nov. 10-14

SALONS

Chicago, Drake Hotel .....Nov. 8-15
New York, Commodore Hotel..Nov. 30-Dec. 6

RACES

Indianapolis .....May 30
Belgium .....July 5-6
Germany (Grand Prix) .....July 13
Belgium (European Grand Prix)....July 20
Spain .....July 27
Italy (Grand Prix) .....Sept. 7
France (Grand Prix) .....Sept. 21